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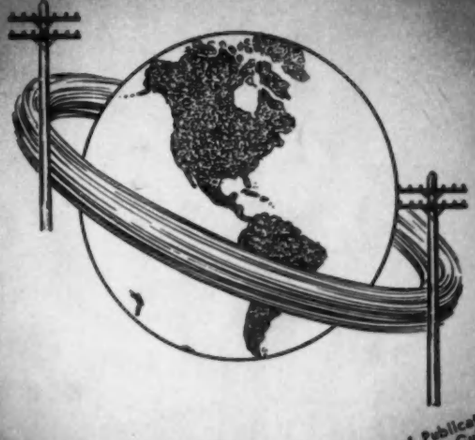
THE NATIONAL TELEPHONE MAGAZINE

TELEPHONE ENGINEER AND Management



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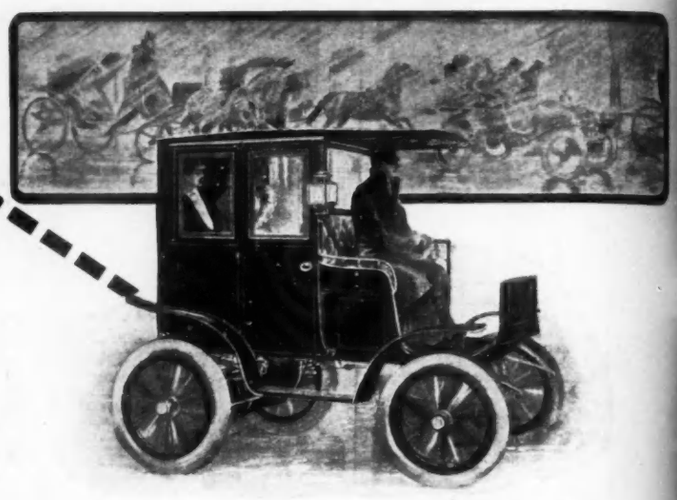
NOVEMBER 1943

In 1907, when Station Wagons Were Truly "HORSELESS CARRIAGES"

The Pope-Waverley Electric Station Wagon



No automobile stable is complete without this luxuriously appointed carriage. Price, with standard equipment, $2,250.

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Never in the history of the automobile industry has the electric type been so popular as now.

There are good, substantial reasons why it is so popular.

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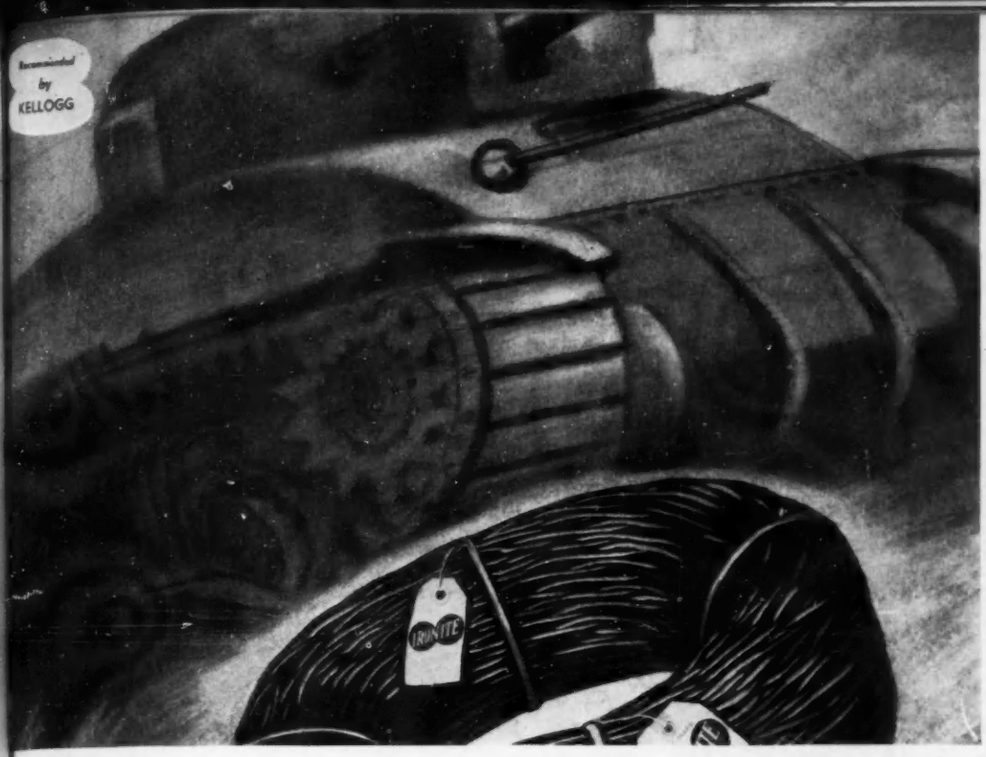
"BE SURE THE NAME POPE IS ON YOUR AUTOMOBILE."

Never accept substitutes; insist on getting what you ask for.

80

LEICH *manufacturers of telephones, switchboards and related apparatus since 1907*



Paragon Electric Co. Ironite Drop Wire is "armored" for protection against hot winds as well as sleet and ice. In addition, this quality wire saves critical metals like copper, now urgently needed for numerous war materials. Every coil is tagged for your protection.

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The Amendments to WPB Order U-3 have been issued and we are reproducing in this issue the War Activities Bulletin No. 7 of the National Association. The promptness of this Bulletin following the issuance of the Order leads us to commend the activities of the Committee very highly. The USITA is doing a great job for Independent telephony. Read the Bulletin on page 25.

▼

We are pleased to hear that Howard O. Leinard of Cleveland is convalescing nicely following a major operation in early October. Incidentally, this illness resulted in Howard finally ruining his attendance record at the National Convention in Chicago, which was unbroken for many years. From all reports he will be up and active again before long.

▼

Thanks to you readers, our Letters Column is progressing nicely. The one we are using in this magazine on page 34 is both instructive and timeworthy. Many of you Independents during this wartime emergency have improvised tools that are of real value and by notifying us of them you will be doing the industry a good deed.

Ray

TELEPHONE ENGINEER AND MANAGEMENT

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Highlights of the Communications News

Important Communications developments of the past month, briefed for busy readers

by

ROLAND C. DAVIES
Editor, Telecommunications Reports

WITH the increasing number of successes in the battlefield, post-war planning policies and programs are being crystallized in the National Capital. It is anticipated that the formulation of the policies into a uniform status will be effected both through the Executive Branch under the leadership of Bernard Baruch and in Congress through the work of several committees, notably the Truman Committee.

For the telephone manufacturing industry the major problems of reconversion are what policies are to be determined in the cases of contract termination by the armed services after the war production slackens off and what plans will be made by the government for the disposition of surplus apparatus and equipment. In the case of the telephone operating companies the most important problem will be close observation of the termination of contracts by the armed services, when the end of the war comes, and it is emphatically the warning of the leadership in the telephone industry that all companies maintain their billing of the armed services up to date as closely as possible.

By and large, the telephone industry is felt to have less problems in reconversion to a peace time economy than many other industrial fields. The manufacturing industry will have a huge backlog of equipment orders from the operating companies as soon as the war limitations are relaxed. The operating companies, on the other hand, will continue to furnish their services to the public with comparatively little curtailment of usage except in the case of the Army and Navy bases and camps being closed down.

Undoubtedly influenced by the results of the election, President Roosevelt is calling upon business men and industrialists for assistance and advice in planning for the reconversion. An important meeting for the drafting of these post-war blueprints will be the November 22 session of the newly-created Business War Advisory Council with the President which has among its membership U. S. Chamber of Commerce President Eric Johnston, National Association of Manufacturers President Crawford and President David Sarnoff of the Radio Corporation of America. This group was called upon by President Roosevelt to furnish the views of industry on renegotiation, contract termination, employment of returning servicemen, disposition of government plants and war equipment and a number of other problems connected with the end of the war. In connection with the recent election, incidentally, the political gossip in Washington is quite certain that the Republican trend will keep up and that at least the next Congress will be Republican and possibly the Senate. There are also many who think President Roosevelt—as has been predicted by William Allen White—will not run for a fourth term, but many competent observers still are unconvinced about the fourth term outlook, because of the present division within the Republican ranks on that party's presidential candidate.

The Communications industry has immediately ahead of it two important events connected with its post-war future which are now being plotted in Washington. They are the Senate Interstate Commerce Committee's study of International communications and the potential merger of American international communications companies, (detailed summary of this situation carried later in this column) and the commencement of the allocation of radio frequencies under the aegis of the FCC and its Chairman James Lawrence Fly. The latter planning for allocation of radio frequencies was slated to be launched at a conference November 17 at the FCC with the leading government agencies and topflight of the radio industry's engineers participating. Radiotelephony may be a most important medium for the Independent telephone industry and the U. S. Independent Telephone Association is expected to be represented at this meeting. In addition, the Independent telephone industry will have another important representative at this allocation session in Ray Manson, Vice President and General Manager of the Stromberg-Carlson Company who will be the principal spokesman at the meeting for the Radio Manufacturers Association. (Details of this meeting appear elsewhere in this column.)

1944 Construction Program

THE 1944 construction program of the Bell System and Independent industry was in the final stages of approval by the War Production Board as this issue went to press. The program of both branches of the telephone industry, because it projected a considerable expansion of toll facilities and other additions during the next year, had to hurdle the two top agencies of the WPB—the Program, Adjustment Committee and the Requirements Committee—to secure complete sanction with Communications Division Director Leighton H. Peebles explaining the needs of the industry before both parties.

The requirements of the armed services in 1944 and the latter part of 1943

Maurice K. McGrath Dies

Major Maurice K. McGrath, recently retired president of the Kellogg Switchboard and Supply Company, died unexpectedly on November 12 in Palm Beach, Florida. He was 66 years old.

Major McGrath a veteran telephone executive, began his career with the Western Electric Company in Chicago, later held posts with the telephone equipment companies in Belgium, Italy and France. He was associated with the Bell Telephone laboratories in New York and the International Telephone and Telegraph Companies in Europe.

During World War I he served as a major commanding A. E. F. inspection section, Signal Corps. He was vice-president of Postal Telegraph and Cable Company from 1931-39 when he became president of the Kellogg Company. On October 19, Major McGrath resigned his position because of ill health and was succeeded by James G. Kellogg. He retained connection with the Kellogg Company in the capacity of a company director.

nave remained about the same as in 1942. But because of the great demand for radio and electronic apparatus by the Army and Navy, telephone and telegraphic requirements only amounted to 8% of the total armed services' procurement in the latter part of this year as compared with 13% of the total in 1942.

The 1944 construction program is deemed adequate to take care of the essential war, war production and civilian health and safety needs along the lines and policies which have been adhered to so closely and in such a practical way by the WPB Communications Division in the past. A major phase of the Bell System's 1944 program is the expansion of its toll facilities to furnish approximately 7,000 additional toll circuits which should aid in relieving the strain in certain critical areas of the nation. The Independent industry is going to receive allocations of materials to remedy tight local exchange service situations and some toll spots which threaten to be critical.

The WPB advisory committees of the Communications Division will meet November 18 and 19, respectively the Operating and Manufacturing Committees.

Convention Dates

Alabama Independent Telephone Association, Jefferson Davis Hotel, Montgomery, November 15 and 16.

Missouri Telephone Association, Muehlbach Hotel, Kansas City, November 16 and 17.

Oklahoma Telephone Association, Huckins Hotel, Oklahoma City, November 29 and 30.

Excise Taxes

THE telephone industry will have to impose upon its subscribers increased excise taxes, both in the case of toll calls and local exchange service, if Congress approves the excise tax rates as they have been adopted by the House Ways and Means Committee. The only hope for a revision, which is being sought by the industry in the case of the 50% boost in the excise tax rate on local exchange service, now lies with the Senate Finance Committee, which will review the tax bill as passed by the House.

The House Ways and Means Committee adopted the Treasury-recommended excises for the telephone industry—25% in the case of toll calls and the boost from the present 10% to 15% for local exchange service. In addition, if the House rates are finally enacted, the increase in the excess profits tax to a 95% rate will hit hard at the larger telephone companies and will have particularly a severe impact upon the Bell System. It is estimated that the A. T. & T. in meeting this tax increase will have a higher tax burden equivalent to $1.50 per share of common stock.

The Independent telephone industry through its U. S. Independent Telephone Association, and especially the latter's Tax Committee headed by president Harold V. Bozell, of the General Telephone Corp., has been carrying the ball before the Congressional committees in regard to the increase of the excise tax to 15% for local exchange service. The USITA pointed out to the House Ways and Means Committee the effect of this increase on telephone subscribers with such emphasis that the committee took the unusual step of reconsidering this excise rate after it had previously adopted it. The committee had informed the House body that this local exchange excise was somewhat equivalent to a specialized sales tax in that it was imposed on some 24 million telephone subscribers. The USITA stressed that this tax was not on any luxury but on an absolute necessity and would be borne by the "little people," small businesses, farmers and occupants of residences who make up 75% to 80% of the telephone users. The importance to farmers of telephone service and the value of telephones in the present days of gasoline and rubber shortages to maintain civilian morale were other arguments used, while the importance of the telephone to the war effort was also depicted. Over 80% of the 5 million Independent telephones are in residences and of this 80% one-fourth are rural, with many of the latter on party lines.

The House Committee was also informed that in the case of the Bell System it collects $385,000,000 annually in the long distance and local exchange excises from telephone users, under the present rates. It costs the Bell System 5% of this amount to do this work of collection for Uncle Sam. If the local exchange tax is raised the 50%, the telephone industry will have

Letter of Appreciation

October 25, 1943

Board of Directors
United States Independent Telephone Assn.
Munsey Building
Washington, D. C.

Gentlemen:

I beg to acknowledge receipt of your letter dated October 19th, 1943, informing me that I have been unanimously elected as an Honorary Member in your splendid organization and the only one in this wonderful country of ours.

My limited command of the English language leaves me utterly incapable of conveying to you my truly deep appreciation for this signal honor.

It was necessary for me to read and re-read your letter of notification several times before I could fully absorb the great import thereof. You will never know how much this means to me.

It is just such grand gestures as this from such people like you that spread the sunshine of happiness in the eventide of one's life and brighten the gloom of advancing years.

I only wish I could adequately express to you my deep feeling of thanks and gratitude for this illustrious honor but about all I can say is thank you from the bottom of my heart.

With my very best wishes to one grand and glorious organization, I am,

Most sincerely,
J. K. Johnston

to replace 20,000,000 addressograph plates which are set up in connection with the present 10% tax rate and this will mean not only a substantial expense, but the use of critical materials.

International Communications

THE all-embracing survey of American international communications with the aim of legislation for the establishment of a cable-radiotelegraph merger in this field, which is to be conducted by a Senate Interstate Commerce Subcommittee, is not slated to reach the stage of hearings for several weeks and possibly not until after the first of the year. The membership of the subcommittee has not yet been selected by Chairman Wheeler, of the Senate Committee, but will probably be designated during the latter part of November with the outlining of the body's plans for hearings.

The Senate group which is to make this study—one of the most important ever staged in Congress for the communications industry—is going to rely on the significant State Department interdepartmental Telecommunications Postwar Planning Committee, which has been engaged under the chairmanship of Assistant Secretary of State Breckinridge Long for several months in the analysis of international communications, to furnish the basic background and data of the world situation in this field. When the hearings are staged, it is expected that many outstanding communications industry executives, representing the A. T. & T., cable and radiotelegraph companies, will present their appraisals of the United States position in postwar international communications and will undoubtedly advocate the merger of international communications companies—a subject which has been before governmental bodies and Congress for the past several years.

While there is a certain coterie of government officials who feel that any international merger should be government-controlled and even government-operated, there is naturally much opposition both in other government circles and in Congress to a departure from the present policy of private ownership and operation. In fact, the outlook as the Senate subcommittee was commencing its study of the problem was that private ownership would be the key and the plan, now uppermost, was for the establishment of a merger, created under a special Congressional charter which might include one or two government officials as directors on the board of such a consolidated company, with powers to rule on questions of national interest and national defense. Even though this is remote from the Independent telephone industry to a large extent, the bogey of government ownership in international communications might well mean the opening wedge for government ownership in domestic telephone communications.

In the pole line construction, a jeep is seen pulling a "running board" of reels of wire being strung out.

Signal Corps Photo

Senate Committee Raps FCC as Inadequate to Regulate International Merger

THE Senate resolution of inquiry into the international communications picture which was sponsored by Senators Wheeler, White and McFarland, was most broad and comprehensive. It plans a study, according to its sponsors, that will form the communication policies after the war. Through this study, Chairman Wheeler of the Senate Interstate Commerce Committee pointed out that Congress felt it should undertake the study of the world communications picture so as to assume the leadership in the postwar planning in this field and that Congress did not feel it should undertake the legislation in international communications without such an advanced study. Senator Wheeler noted that he and the other Senators had been aware of the previous inquiry by the State and other Departments and that his committee wanted to be prepared on the subject before any "canned" legislative recommendation was transmitted to them.

In the report of the Senate Interstate Commerce Committee approving the resolution (S Res. 187), that committee stressed two points that the Navy "has a long and continuing interest in the problem of United States international communications" and was better informed than other government agencies on its background and immediate problems; and that the FCC, because of the growing criticism against it and its personnel in Congress, might not be the proper agency for the regulation of the international merged company.

The Senate Committee's report in its comment on the FCC (which was not identified by name in the document) stated that admittedly the existing law is inadequate to cope with the postwar world communications problems, but "the inadequacies of the law are further complicated by frequent and growing criticism of the administrative agency and its personnel —criticism which no longer can be ignored by Congress. That administrative agency is an arm of the Congress, and, as such, is responsible to it. It is the duty of the Congress to ascertain in advance whether its creature is competent and experienced enough to undertake duties (the regulation of international communication monopolies) which inevitably must be thrust upon it; or whether a different method of selecting administrators for technical duties must be advocated."

Views of Five Senators

THE report noted that the international merger had been removed from the domestic merger bill because the problem required far more information than was then available to answer questions which had arisen before correct legislative action could be taken. At the time of the domestic merger hearings before the Senate, Rear Admiral S. C. Hooper (now re-

(Please turn to page 43)

A QUESTION!

By an Independent Telephone Pioneer

When was the first submarine demonstrated and by whom?

(For answer turn to page 46)

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Alternating Current Theory
Part VII---A

Differences Between A. C. and D. C.

IN the previous lessons we discussed only direct current theory and apparatus, although some reference was made to current reversing in a circuit and this effect was referred to as A. C. current. For purposes of definition we may say that **direct current flows always in the same direction**. The flow may be either steady, intermittent, or rapidly fluctuating but so long as it continues to flow through the circuit in the same direction we refer to it as direct current.

Alternating current, on the other hand, **is electricity which flows first in one direction and then in the opposite direction.** The reversal of its direction of flow occurs in a definite and periodic manner.

A. C. Inherently Generated

AS HAS been stated, all generators inherently generate alternating current as a result of the moving coils necessarily having to pass both a north and south magnetic pole in making a complete revolution.

To get direct current out of any generator we must therefore resort to a **commutator.** Batteries, on the other hand, inherently generate direct current; hence, to get alternating current from batteries we must resort to some form of **pole changing mechanism** which mechanically or electrically reverses the connections in the external circuit so that we get alternating current.

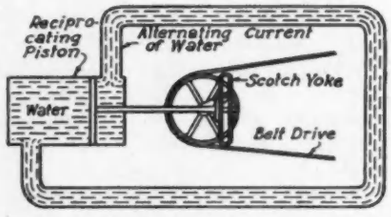


Fig. 1. Hydraulic analogy of A.C. current

Figure 1 illustrates hydraulically how a medium such as water could be made to reverse its direction of flow in a periodic manner, and the reversal of the water flow in the pipe is analagous to the reversal of current in an A. C. Circuit.

A. C. More Difficult

ALTERNATING current is more difficult to understand than direct current, and it is generally necessary to resort to curves and graphs to illus-

Because of the enthusiasm with which the first six lessons of TELEPHONE ENGINEER'S Training Course, "Electrical Fundamentals for the Telephone Man," have been received, we are continuing the course in this and following issues. Parts VII through X will deal with the study of A. C. Electricity, and the final lessons will treat the theory and use of electrical testing instruments. Diplomas will not be issued until the entire course has been completed.

Ray W. Smith, Editor

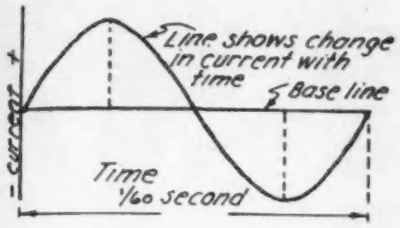


Fig. 2. Graph showing current variation in 60 cycle A.C. circuit

trate how alternating current acts. For the purpose of this text which must necessarily be brief we can say that alternating current of the type found in ordinary lighting and power circuits goes through the following variations:

It starts at zero voltage and gradually increases in magnitude until it reaches some maximum voltages in a given direction and then gradually decreases until it again reaches zero voltage. It then starts increasing but in an opposite direction until it again reaches a maximum value. From the maximum value it decreases until it again reaches zero voltage, thus completing the cycle.

Cycle and Frequency

THIS complete change in events just described is referred to as a **cycle** and the number of these complete cycles which occur per second in an A. C. circuit is referred to as **the frequency of that circuit.** For example, in our regular light and power circuits the usual frequency is 60 cycles per second; in other words, the current and voltage go through 60 complete variations as described above every second.

Figure 2 shows, by means of a graph, how an A. C. current having a 60 cycle frequency reverses each cycle.

Action in House Lighting Circuit

FOR those completely unfamiliar with A. C. theory a better appreciation of what has just been said might be obtained if we will but look at an ordinary house light and consider the fact that the electricity supplying this light has actually a zero voltage value 120 times a second and that at the peak points in the cycle the voltage impressed across the lamp is actually 154 volts instead of the usual 110 volts at which the circuit is rated. Due to the rapidity with which the voltage passes through zero, the eye does not perceive any difference in light brilliancy. Alternating current theory is one of the most fascinating subjects that one can study, and contrary to popular belief, one does not need a broad mathematical knowledge to become fairly conversant with it.

A. C. Sine Waves

ALTERNATING current generators are so designed that the conductors which move through the magnetic field generate what is known **as a sine wave voltage. "A sine wave is one in which the instantaneous voltage or current at any point in a cycle is proportional to the sine of the angle of coil revolution at that point in the cycle."** Figure 3 shows how a sine wave is developed by a single coil generator with the coil revolving through 360°.

Referring to this figure it will be noted that the moving conductor shown in the circle starts at zero degrees and revolves in a counter-clockwise direction. The voltage generated varies at different points in the rotation and is a maximum when the conductor is moving across the magnetic field at right angles. If the coils of a generator are properly designed the voltage generated at any instant is proportional to the sine of the angle through which the conductor has moved. For example, when the conductor is moving through the 30 degree position the instantaneous voltage would be 0.5 of the maximum voltage inasmuch as the sine of 30 degrees is 0.5. The relationship between the revolving conductor and the voltage generated is shown graphically by projecting the instantaneous voltage generated by the moving conductor to a point on the curve which shows the angular position at that instant.

Waves which are not of a sine character contain what are known as **harmonics;** that is, frequencies of 2, 3, or more times the fundamental or basic frequencies. These harmonics may seriously interfere with the proper operation of the circuit which carries the alternating current. Hence the need for a sine wave variation.

Three Values of an A. C. Wave

AN ALTERNATING current wave has three values which must be considered in dealing with this type of current. It is obvious that inasmuch as the current and voltage of the generated wave are changing from instant to instant we cannot say that the voltage of an A. C. wave is zero volts, or

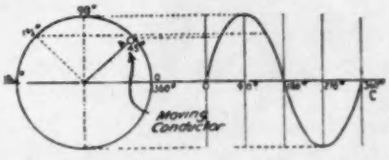


Fig. 3. Development of sine wave by moving conductor

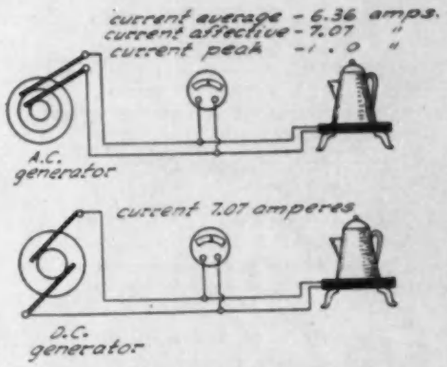


Fig. 4. Relationship between direct and alternating current for the same heating effect

10 volts, or 50 volts if, for example, it ranges all the way from zero to 154 volts. How then should A. C. voltage or current be specified?

To obtain a proper understanding of this, let us consider a typical 110 volt, 60 cycle house lighting circuit. We refer to the voltage of this circuit as 110 volts. For various reasons it has been decided that alternating current circuits can best be rated by what is known as their **effective value.** The effective value of any alternating current circuit is 70.7 per cent of its peak value. For example, in the 110 volt circuit the peak value is approximately 154 volts and 70.7 per cent of this value amounts to 110 volts which is the effective voltage rating of a 154 volt peak value circuit. (Note.—The peak value is the maximum magnitude reached during either half cycle of an A.C. wave.)

Reason That R. M. S. Value is 70.7% of Peak

THE reason that the effective value is taken as 70.7 per cent of the peak value is that it has been found that a **direct current source will produce as much heat as an alternating current source whose peak value is 1.4 times the value of the direct current source.** For example, an alternating current source whose peak value is 1,000 amperes will produce only as much heat as a direct current source of 707 amperes. The relationship between direct current and effective A. C. current is shown in Figure 4.

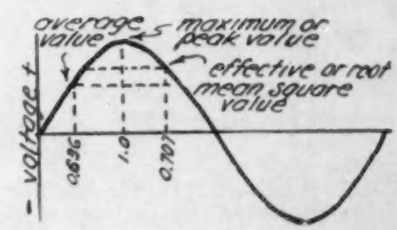


Fig. 5. The three values of an A.C. wave

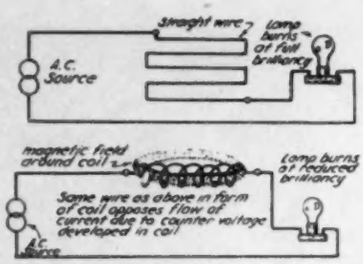

Straight wire
Lamp burns at full brilliancy
A.C. Source
magnetic field around coil
Lamp burns at reduced brilliancy
Same wire as above in form of coil opposes flow of current due to counter voltage developed in coil
A.C. Source

Fig. 6. Effect of coiled conductors on current in an A.C. circuit

The term "Root-Mean-Square" value is often seen in technical articles and means exactly the same thing as the "effective value." This term originates from the fact that the effective value is arrived at by taking the square root of the average of all the squares of each separate sine value, thus giving the actual heating effect of the A.C wave. The student should keep in mind that all or virtually all testing instruments such as ammeters, voltmeters, transformer ratings, etc., are calibrated in terms of effective values.

Average Value

THE **average value** of an alternating current wave is obtainable by taking the average of all of the separate sine values and is found equal to 0.636 times the maximum value or 63.6 per cent of the maximum value. The average value of an AC wave is not ordinarily used, as we are generally concerned in most of our computations and measurements only with effective values.

Maximum or Peak Values

THE **maximum** or **peak value** of an alternating current wave is, as has already been explained, the maximum value to which the current or voltage rises during the positive or negative half-cycle. It should be remembered that this value is 1.4 times the effective value, or that the effective value is .707 of the peak value. These relationships are shown in Figure 5.

Alternating Current Reactance

IN DIRECT current circuits, current is held back by the ohmic resistance of the circuit. This resistance is due to the character of the metallic path through which the current flows. If the path is copper, the resistance is low. If the path is iron, the resistance may be higher and the current greatly reduced.

IN ALTERNATING current circuits, we encounter a new impeding or retarding effect which is due not to the physical composition of the metallic conductors through which current flows but rather to their shape. The retarding effect encountered in alternating current circuits is referred to as **inductive reactance** and is due to a property of coiled conductors. This property of coiled conductors is referred to as **inductance.**

This retarding effect due to a conductor being coiled rather than straight results from the alternating magnetic field set up by the alternating current flowing in the coil and in its expanding and contracting it effectively "cuts" the several turns of the coil and in so doing generates a voltage in these turns. This voltage opposes the impressed voltage and thus reduces the amount of current that can flow through the coil. Fig. 6 illustrates this effect of coiled conductors.

It should be kept in mind that the retarding effect is referred to as the **inductive reactance of the coil** and the cause of this retarding effect is the **inductance of the coil.**

short wave choke for transmitters — broadcast type choke — line filter choke

Fig. 8. Typical inductance coils

Factors That Control Inductance

THE inductance of a coil is proportional to the number of turns, the diameter of the coil, and the permeability (**Permeability** refers to the quality of the magnetic material) of the core used as shown in Fig. 7. Coils having iron cores have higher inductance than those having air cores for the same number of turns. Coils having large diameters have greater inductance than those having small diameters. The greater the number of turns on the coil, the greater will be the inductance.

The unit of inductance is the **henry.** The henry is defined as the inductance of any circuit in which a current changing at the rate of one ampere per second will induce 1 volt in the circuit. This unit of inductance is represented symbolically by the letter L. The inductance of coils encountered in radio and electrical work varies from a few milli-henries or microhenries in the case of radio tuning coils to 30 or 40 henries in the case of the choke coils used in power supply circuits.

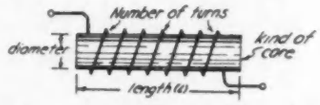


Fig. 7. Factors controlling inductance

Computation of Inductive Reactance

THE retarding effect of inductance in an alternating current circuit can be computed by the simple formula shown below:

$$X_L = 6.28\ fL$$

Where:

X_L = inductive reactance
f = frequency in cycles
L = inductance in henries

In other words, to obtain the inductive reactance in ohms of any coil, we multiply the frequency by the number of henries inductance and by the constant 6.28. This is illustrated in the following problem:

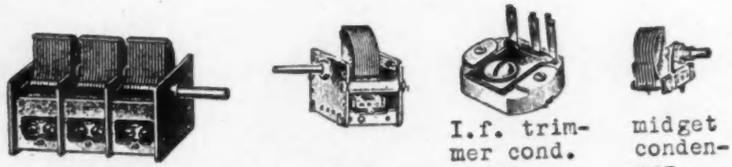
What is the inductive reactance to a 60 cycle current of a choke coil whose inductance is 30 henries?

$$X_L = 6.28fL =$$
$$6.28 \times 60 \times 30 = 11{,}304 \text{ ohms}$$

In other words the 30 henry choke coil would retard the flow of 60 cycle current about the same amount as would a resistor whose resistance was 11,304 ohms.

Chokes are rated in terms of their current handling capacity. If more current than they are designed to carry

(Please turn to page 48)



Three gang tuning condenser. — single gang type. — I.f. trimmer cond. — midget condenser.

Fig. 9. Air dielectric variable radio tuning condensers

Amend

WPB Order U-3

War Activities Bulletin No. 7

(Editor's Note—You will notice in the letter reproduced on this page that the United States Independent Telephone Association's able Postwar Plans and War Activities Committees has already made their interpretations and comments on the revised WPB Order U-3 issued October 30, 1943. Because it is the clearest and most concise interpretation that could have been prepared we are presenting it verbatim. Copies of the Amended Order U-3 may be had by addressing the Association at the Munsey Building in Washington.)

General

The Communications Division of the War Production Board has revised its Order U-3. The new order carries an issue date of October 30, 1943. While the revision consists primarily of a reediting of the order so as to make it easier to read and understand, several changes have been made in the terms of the order. Companion Order U-2 is also undergoing revision and will probably be issued soon. We will advise promptly upon its release. This bulletin discusses the principal changes in the provisions and arrangement of Order U-3.

Changes in Provisions

The principal changes which have been made are as follows:

1. The allotment symbol MRO-U authorized by the old order has been replaced by the allotment number U-9. The new order makes it clear that in using the allotment number and the preference rating of AA-1 to obtain controlled and non-controlled materials it is only necessary to place the following certification across the face of the order:

"Allotment Number U-9—Preference Rating AA-1

The undersigned operator certifies, subject to the penalties of Section 35-A

To All Independent Telephone Companies:

This Bulletin has been prepared by the Committee on Postwar Plans and War Activities of the United States Independent Telephone Association (successor to the Post War Planning Committee and the War Activities Committee of the Association), and is issued by the Association and distributed by it, with the cooperation of state telephone associations, to all Independent telephone companies.

This is one of a series of War Activities Bulletins that have been issued and so distributed by the National Association, for the information and guidance of telephone companies in meeting Governmental war-time requirements. Further Bulletins will be issued, from time to time, as need arises.

It is extremely important that every Independent company, both large and small, be fully informed on the many orders, regulations and war-time measures that now influence and determine the conduct of their day-to-day operations.

To assure the receipt of these Bulletins and other important information of this character, every Independent company should be a member of a telephone association. All Class A and Class B companies should be members of the United States Independent Telephone Association and also of their state association. Companies with less than $50,000 annual gross revenue should be members of their state association or, if there is no association in their state, they should be members of the United States Independent Telephone Association.

Companies that are not now members of a telephone association are urged to obtain such membership at once in order to assure them that they will be kept informed of these vital matters.

Committee on Postwar Plans and War Activities,
United States Independent Telephone Association.

November 6, 1943

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of the United States Criminal Code, to the seller and to the War Production Board, that, to the best of his knowledge and belief, the undersigned is authorized under applicable War Production Board regulations or orders, and under all provisions of Utilities Orders U-2, U-3 and U-6, to place this delivery order, to receive the item(s) ordered for the purpose for which ordered and to use any preference rating or allotment number which the undersigned has placed on this order.

....."

(Signed)

It is no longer necessary to show opposite each of the ordered items the allotment number or preference rating, as the certification shown above will suffice for all items ordered whether for controlled or non-controlled materials.

2. A new provision permits the use of **operating supplies** in amounts not exceeding $50 on any project specifically approved by the War Production Board on Form WPB-2774 or other alternative form. This provision will permit small quantities of either controlled or non-controlled materials to be obtained for use on projects without the necessity for filing a new application. This will permit the use of small quantities of operating supplies in the operator's stocks in lieu of ordering these minor items especially for a project. The provision will also be useful in obtaining a small quantity of low cost items which may have been overlooked in a priority application covering a specific project.

3. The section of the old order pertaining to the assignment of ratings for materials needed for the construction of facilities for defense projects and requiring the filing of Form PD-685 has been revoked. Material for all projects, regardless of whether or not they are defense projects can now be obtained only by the use of Form WPB-2774.

4. The paragraph relating to restrictions on obtaining teletypewriter materials which appeared in the old order has been revoked, as teletypewriters are now covered by the telegraph Order U-6.

5. A new provision specifies that operators whose "operator's inventory" at the end of 1942 or whose use of material during 1942 did not exceed $10,000 must not in any single case use "operating supplies," obtained under this order, costing more than $500. For example, a small operator falling within this limit could not install new cable plant to serve schedule A business subscribers if the cost was in excess of $500 even though such plant addition is permitted by Order U-2. When the small operator requires operating supplies for a single project costing in excess of $500, he should file application for priority assistance and authority to begin construction on Form 2774 as required by paragraph (d).

6. The order authorizes the use of the ratings to obtain material required for maintenance and repair of buildings essential to the conduct of an operator's business. Ratings may be used for construction material only to the extent that such construction is permitted by Order L-41.

7. In no instance may and operator begin construction involving material costing in excess of $5,000 without filing and obtaining approval on Form WPB-2774. In the case of toll line construction, like approval must be obtained whenever the cost of material exceeds $500. Approval for the construction of telegraph and teletypewriter facilities must likewise be obtained on Form WPB-2774 whenever the cost of material involved exceeds $2,500. It makes no difference whether or not priority assistance is needed to obtain the above material. Approval must be obtained even when the material is in stock and regardless of whether or not a rating was used to obtain it. (see par. (d) of order.)

8. The former order exempted small operators whose average inventory for the five years prior to 1942 did not exceed $10,000 from certain inventory restrictions. The new order has been changed to read "any operator whose **operator's inventory did not exceed $10,000 at the end of 1942** is exempt from the inventory restrictions . . . " This change merely makes it easier for the small company to determine whether it is exempt from the inventory restrictions.

9. A provision in the former order required the use of a rating for whatever material was purchased by one operator from another. By the omission of this provision from the new order, Priority Regulation No. 1 now governs all sales of material between operators with the exception of "industrial material," as defined in Priorities Regulation No. 13. From a practical standpoint the effect on an operator is as follows:

1. To permit sales of material between operators without ratings when such material has been obtained by the selling operator without rating.
2. To require the passing of a rating between operators for the purchase of material originally obtained by the selling operator by means of a rating. Such rating must be at least equivalent to the rating used by the selling operator to obtain the material to be sold.
3. To prohibit the use of a rating on sales of "industrial material" between operators and to permit such sale without rating. "Industrial material" appears to be wire, cable, and strand.

It should be noted that if an operator makes a purchase from another operator's stock which has been set aside for emergency purposes, such material purchased must also be used for emergency purposes similar to those for which it was first set aside.

Editorial Improvement In New Order

The principal editorial improvements in the new order have been the addition of an index, better arrangement of definitions, and the use of shorter and more concise paragraphs. A distinct betterment has resulted from the elimination of numerous paragraph number references which made the old order particularly hard to follow, as well as the simplification which results from the new order being set up on a "use" rather than a "material delivery basis."

THE COMMITTEE

You are indebted to the names below for this timely interpretation of the revised WPB Order U-3 given on these pages. They are the members of the Postwar Plans and War Activities Committee of the USITA.

E. C. Blomeyer, Chicago, Ill., Chairman.
W. M. Angle, Rochester, N. Y.
H. V. Bozell, New York, N. Y.
C D. Brorein, Tampa, Fla.
A. L. Hart, Abilene, Kans.
R. A. Lumpkin, Mattoon, Ill.
R. A. Phillips, Sioux Falls, S. D.
J. R. Porter, Tarboro, N. C.
Lloyd Wright, Jamestown, N. Y.
B. C. Burden, Washington, Secretary.

Trip for "Long Distance"

The Office of War Information has selected the film "Long Distance" for showings in various countries as part of the program of infrming foreign lands about the United States, its war effort and its way of life. The film presents the story of men, materials and machines behind long distance.

South Dakota Men Manifest Keen Interest in "War Conference"

ALTHOUGH the printed program called the annual gathering of South Dakota telephone men who met in Mitchell, S. D. on October 21st, a Convention, yet the Board of Directors in arranging for the meeting preferred to call it a War Conference.

The following directors were elected: C. E. Davey of Clear Lake, and Lester O'Neal of Fedora taking the places of H. M. Schumacher, Alexandria and Gust Quast, Menno whose terms expired. The hold over directors are Rob't W. Aszmus, Stickney; Ira S. Burnett, Armour; H. R. Burr, Faulkton; F. H. McGinnis, Aberdeen; Wm. L. Ramlet, Hurley, L. P. Ulrich, Woonsocket and F. E. Wheeler, Scotland. The Board organized by electing the following officers for the coming year,—President, Wm. L. Ramlet, 1st V. Pres. L. P. Ulrich, 2nd V. Pres., H. R. Burr, and Secretary-Treasurer, Charles E. Adams.

Secretary Charles E. Adams gave a report of the work of the year, stating that the association was in good financial condition and that only two assessments had been necessary during the past four years. Four bulletins had been issued during the year, keeping the members advised on current topics and changes—also that several new members had been added to the active membership list.

President L. P. Ulrich, tho not a seventh son of a seventh son, nevertheless took a look into the future and found things not too disquieting. He said that the changes taking place require continuous planning on the part of the operating telephone companies and to keep abreast of the times, it is necessary to be fully informed as to the trend of business from day to day and this can be done by becoming a member of your telephone Association, and by reading carefully the trade journals.

"Telephone rates under present conditions," was the subject of C. A. Merkle, Chairman Public Utilities Commission, Pierre. This was the first opportunity that Chairman Merkle had had to address the telephone group and his remarks were very inspiring.

"The Withholding tax and other payroll accounting problems" was ably discussed by Earle L. Decker of the Central Electric and Telephone Co. Sioux Falls.

Mr. J. C. Crowley Jr., secretary of the Minnesota Telephone Association talked on the subject, "Chickens come home to Roost," not in the barnyard meaning, but in the way that inadequate rates and improper maintenance will react to bring disaster to a company so conducted. His talk was a real challenge for the small company to stop and analyze their conditions, to see how best to improve their situation. Said Mr. Crowley, "During 1941 we secured for 13 companies additional revenues of $25,-785,000. During 1943 we secured for 15 companies additional revenues of $19,-390.50. Ten of the above cases were submitted to the O.P.A. and on the information forwarded with the applications our Commission was advised that there would be no intervention."

Chas. C. Deering, secretary of the USITA gave a complete review of the National Situation as it stands at this time. Secretary Deering expressed the thought that so much has been done by the National and State associations that have brought dollars to all Independent telephone companies that it seems trite to keep mentioning them, but it is necessary to do so. To be in a more advantageous position to help, the general offices have been moved to Washington, where the office is constantly on the watch for things adverse to telephone interests.

Mr. L. J. Ollig of Waverly, Minn., who owns telephone properties in South Dakota came over to be the M.C. at the session of "Information Please." This is the second year that this feature has been on the program and it has proved of great benefit to all. The discussions were not completed, but were finally called for *time*.

Obituary

Bernard E. Sunny, known as the father of telephone service in Chicago, died Oct. 5 at his home in Chicago, Ill., of a circulatory ailment. He was 87.

Sunny had been active in his many interests, both financial and philanthropic, until recently when he began to fail. He remained at home, compelled to forgo his daily visits to his office.

Sunny rose to leadership of the Illinois Bell Telephone Co., one of the most important subsidiaries of American Telephone & Telegraph Co., the "hard way."

Cable Wrapping Machine

By J. M. HARDESTY

Bell Laboratories Record

THERE are occasions when pole lines and aerial cables have to be replaced with underground construction. This may be done by installing new cable in conduit or by plowing-in a cable protected at the factory against soil corrosion by layers of asphalt paper and jute. Under present restrictions on materials new cable is difficult to obtain. This limitation has been avoided in a method recently developed by the Laboratories. The

An underrunning carriage lifts the cable to a convenient height for applying the protective coating and then from its rear sheave drops the treated cable into the trench.

aerial cable is lowered from the poles and then equipped for burial by applying a coating of asphalt and a wrapping of felt tape. This will save critical materials and it can be done without service interruptions. The tools developed for doing the work are not yet in in production but will include a cable lowering guide to help drop the cable from the strand to the ground, a wrapping machine to apply the protective covering to the cable and a carriage to lift the cable for wrapping and then to drop it into the trench. The lowering guide, shown above, supports the cable and prevents excessive bending when the lineman rides the strand to remove the cable rings. As the guide moves forward the cable drops in a wide arc to the ground where it is prepared for burial as shown above.

Parts of the same process can be employed where corrosion is occurring in underground cables. In these locations the subway is opened and the exposed cables are wrapped and relaid, as buried cables, in the same trench.

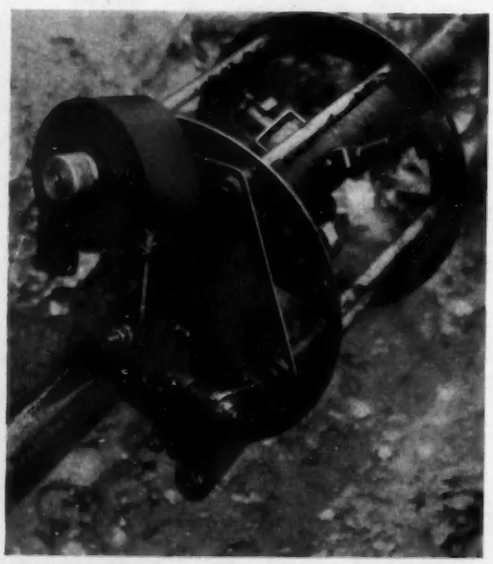
Vote for Municipal Ownership

Citizens of Savanna, Ill., will vote Nov. 18 on the question of whether or not the city will purchase the Savanna properties of the Northern Illinois Utilities company.

Property in question includes the electric and gas plant and equipment of the company in Savanna, as well as the country lines which it owns and operates in this area.

Purchase price, the council was informed, is $825,000, and an additional $50,000 is deemed necessary as working capital. The money would be secured through sale of 4 per cent public utility certificates, to be paid off only from revenues of the property.

Council members suggested that Ivan Shaver, present manager of the utilities company and also of the Illinois Northwestern Telephone company, be retained as manager.



Asphalt is flooded over the cable and followed by a wrapping of felt-like tape to protect against corrosion. The cable wrapping machine, rotated by hand, applies protective tape in a spiral over the asphalt. Adjustments, provided for several tape widths and position of rollers, permit wrapping all cable sizes.

The cable wrapping machine can be used in a trench where the cable is lifted and supported, during the wrapping operation, on timbers which span the trench. This method is used only in locations where the trench is too wide or the terrain too rough for the easy passage of the underrunning carriage.

Supreme Court Decision Reversed On Washington State Rate Order

THE 1940 decisions of the Washington State Department of Public Service which had ordered the Pacific Telephone and Telegraph Co. to reduce exchange rates by $1,053,533 annually, to cut intrastate toll rates by $272,563 and to pass on to local rate payers municipal occupation and franchise taxes and charges totaling $493,915 were reversed recently by the State of Washington Supreme Court. The court in a 77-page decision held the Department had adopted basically and fundamentally erroneous methods of rate determination which infringed the company's constitutional rights and remanded the proceeding back to the Department for further action in accordance with its decree.

Among the errors of the state regulatory body which were held by the Supreme Court and had been previously found by the lower court, the Superior Court, were that the Department was arbitrary in finding the fair value of the company's property was its original cost less the amount of depreciation reserve attributable to Washington intrastate property; the disallowance as operating expenses of all payments under the license contract; the disallowing as operating costs of the payments made by the company to the Bell System Pension trustees; and the exclusion from the rate base of certain land and underground conduit carried in Account 100.3 (property held for future telephone use).

This decision in regard to the pension payments is most important in view of the FCC decision which followed the same line of reasoning as the Washington State Department which the New England Telephone & Telegraph Co. appealed as a test for the Bell System before a Federal three-judge court in Boston and is now pending for decision.)

The State Supreme Court held that a fair rate of return was not less than 6 per cent whereas the Department had found 5 per cent as a fair rate. But the court concluded that bearing in mind the sole question before it was whether the rate of return was so low as to be confiscatory it viewed the 5% rate as not confiscatory. However, the court said the rule of law is that where a reasonable rate is higher than one which is not confiscatory the difference may be determined with finality by the regulatory body.

Rochester Tel. Corp. To Sell Shares To Public

A proposal plan to distribute to the public 76 per cent of the common stock of the Rochester, N. Y., Telephone Corporation was revealed Oct. 28 with the filing of a registration statement with the Securities and Exchange Commission.

The statement disclosed that the eight members of the Rochester group who gained control of the company July 31 by purchasing the stock interest of the New York Telephone Co., agreed to sell 380,000 of the 500,000 shares of $10 par value common stock to a syndicate of 14 underwriters, headed by the First Boston Corporation. The present owners will retain any of the 380,000 shares not sold, it was stated. While the estimated book value of the shares was $13.84 at the time of purchase from the New York Telephone Co., the offering price is to be supplied by amendment, it was stated.

John P. Boylan, president of the Rochester Telephone Corp., who owns 91,169 shares, will sell 72,929; Fred T. Goodwin, Jr., a director of the company, owns 48,384 and will sell 40,944; general counsel T. Carl Nixon has 31,786 shares and plans to dispose of 23,026; counsel and director Frank Devans owns 29,985 and will market 23,025. Others whose shares are being sold, are: Raymond N. Ball, 65,339 owned and 55,019 to be sold; Bernard E. Finucane, 58,819 and 55,019; Sol Heumann, 68,819 and 55,019; and Douglas C. Townson, 68,819 and 55,019.

Patrons Appeal For Higher Rate

A virtually unprecedented type of complaint Oct. 6, threw offices of the Indiana Public Service Commission into momentary confusion and left commissioners wondering what would be next.

A letter from a patron of the Union Telephone Company at Greenfield protested to the commission that rates there are too low and urged the rate-making body to reconsider its rejection last month of a petition by the company for increased charges.

N. H. Keister, Indiana representative of the Fairfield Engineering Company of Marion, O., told the commission that he had to rely on his telephone for war production work and that the service at Greenfield is "unusually good."

'The monthly charge for my telephone rental is $1.50 and, considering the increase in the cost of everything else, I don't see how a telephone company can continue service at such a charge."

Oregon Association Passes Resolution on Toll Committee

On October 30 the officers and directors of the Oregon Independent Telephone Association meeting in Portland passed a unanimous resolution praising the work of the Pacific Coast Telephone Committee.

The resolution read as follows:

"WHEREAS, The Pacific Coast Telephone Committee on Intercompany Settlements has made, during the few weeks that have elapsed since its inception, an outstanding addition to the welfare of the Independent telephone industry on the Pacific Coast, that will result in notable increases of revenue, and amelioration of contractual conditions to the majority of the member companies of this association. BE IT THEREFORE RESOLVED that, we the officers and directors of the Oregon Independent Telephone Association, extend our sincere gratitude and appreciation to all the members of the Committee, to Messrs: D. C. Hood and Gail Wells, who represent this association, and to Mr. J. T. Naylor whose work as secretary has been carried out with a degree of energy, enthusiasm and executive ability that has contributed greatly to the success thus far attained."

Rebates Voluntarily

A refund of $1,095 to subscribers of the Boone County Telephone Company, Harrison, Ark., was made in October according to W. J. Moore, manager of the company. As the company has 1,100 subscribers this amounted to about $1 for each subscriber.

Mr. Moore stated that after 6½ per cent income above operating expenses is allowed that the State Utilities Commission permits a refund to the subscriber. He stated that although the Boone County Telephone Company has the cheapest rate of any telephone company in the state, it is the only telephone in the state that is making a refund to its subscribers this year. The refund is on the preceding year's business.

In the rocky ground where the "earth bore" cannot be used Pfc. Edwin Childs of Petersburg, Va. used a digging bar, while Sgt. John Schramowski, Pittsburgh, Pa. pulls out dirt and stones with a long handled spoon. This is part of the construction of a 15 mile pole line being built on a South Pacific Island.

Signal Corps Photo

Frederick H. Reid Passes

Rounding out his 20th year as president of the Mountain States Telephone and Telegraph Company, Frederick H. Reid died from a sudden heart attack Oct. 29 in his office at the company's headquarters in Denver. The Mountain States company serves seven Rocky Mountain states.

Mr. Reid had been in the telephone industry for 41 years, having started as a collector with the old Colorado Telephone Co. in 1902 after he had finished his course in the Denver high school. He gained much of his early experience as chief clerk to former General Manager E. M. Burgess of that company, who later became vice-president. He served with Mr. Burgess as his chief clerk from 1907, then from 1911 to 1914 while under the Mountain States company. From 1915 to 1920 Mr. Reid was assistant general manager and for the next two years was general manager. He then was transferred to the Southern Bell where he served as operating vice-president from 1922-24.

On June 11, 1924, Mr. Reid became President of the Mountain States company and had served continuously ever since in that post. He was a past National president of the Telephone Pioneers of America and was a director of the U. S. National Bank and of the Presybterian Hospital of Colorado. His brother, Roderick Reid, vice-president in charge of accounts and finance, recently retired from the company. President Reid was born in Inverness, Scotland, on April 6, 1880.

Rejects Commission Ruling

The Utah State Supreme Court Oct. 25 reserved the order of the State Commission, issued in September, 1942, under which the Montain States Telephone and Telegraph Co. was directed to reduce intrastate toll rates in Utah to the level of the A. T. & T. Long Lines interstate rates.

Holding that the Commission had been arbitrary and unlawful in its proceeding of reducing the rates, the Court in remanding the case back to the regulatory body did not undertake to say what the difference would be in the levels in the interstate and intrastate toll rates. In its decision the Court held that in view of the company's evidence the Long Lines schedule is based on conditions throughout the nation but that operating conditions in Utah are unfavorable compared with other sections of the country. The Utah Commission had tried to reduce the intrastate toll rates after the FCC had slashed the Long Lines charges.

Buys Mutual Company

A special meeting of the stockholders of the Kandiyohi Esh. County Telephone Company, was held at the courthouse in Willmar, Minn. Oct. 20. and at the meeting the stockholders voted to sell the physical assets of the company to L. J. Ollig of Waverly, Minn.

The vote to dispose of the company was unanimous, 192 votes being cast in favor of the move, and none voting no.

Mr. Ollig, who now owns nine exchanges in Minnesota and nine in South Dakota, has made an initial payment on the deal, and he will take charge on January 1.

The Kandiyohi county company has 800 miles of line of 500 telephones. The fact that the company is changing hands will in no way effect the operation of the company. The same employees will be kept, the same exchanges and the same rates will be in effect.

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Men with experience in design, research or development of communication systems or apparatus.

A leader in the field of communications located in the Middle West is seeking men of outstanding ability for engineering staff.

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When American bombers are roaring over enemy territory, and the message "approaching target" comes over the intercom system, it's quite likely that the pilot and bombardier are talking over ***your*** telephones.

Those are the telephones you might have received ***if***—if Hitler hadn't invaded Poland, if Japan hadn't attacked Pearl Harbor, or if the United States weren't now putting every ounce of energy into beating the Axis to its knees.

As it is, you and other telephone men are glad to give up those telephones and everything else necessary to help our fighters do the job as quickly as possible. That means making the most of what you have—doing a better job than you ever thought possible, with less material and less manpower.

Because we know it's not an easy job, we want to help wherever we can. If you need advice on meeting heavy wartime traffic, in keeping your equipment working at highest efficiency, in meeting outside plant problems, ask our field service man to work with you; or write direct to us for suggestions.

AUTOMATIC ELECTRIC

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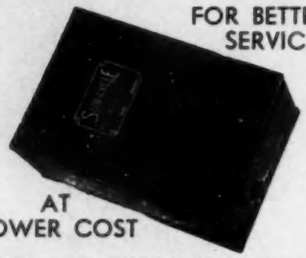
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LORAIN, OHIO

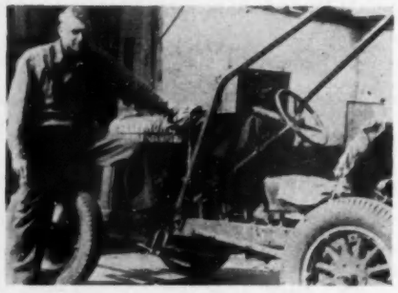
LETTERS

from TELEPHONE ENGINEER readers

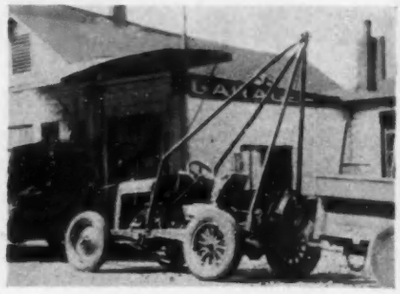
Dear Ray:

Having seen in your magazine, the interest there seems to be in pole derrick and hole boring machines, I thought perhaps you would also be interested in a very ingenious machine I have discovered in my travels for Kellogg Switchboard and Supply Company.

The machine to which I refer was made by Mr. Jim Willis, owner and manager of the North Lewisburg Telephone Company, North Lewisburg, Ohio and is made entirely from discarded and junk parts at a total cost of less than $80.00. The derrick and winch are mounted on an old 1929 Chevrolet chasis which Mr. Willis has geared extra low for power and slow operating speed with a power take up reel mounted in the rear for reeling up wire and strand.



Jim Willis, owner and manager of the North Lewisburg (O.) Tel. Co.



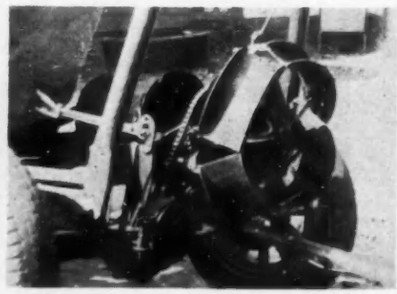
Complete pole derrick mounted on chassis of truck.

The earth boring auger which Mr. Willis is making at the present time will mount in the rear and to the right of the take up reel which can, by removal of a pin, be taken off to make room for the operation of the "hole digger."

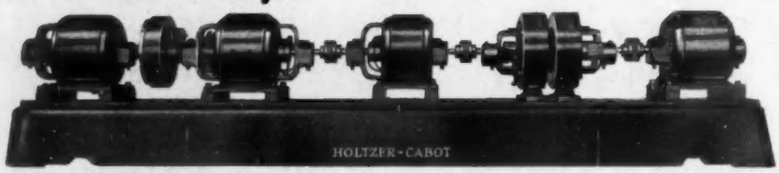
Mr. Willis' exchange, like many small exchanges, requires only one man to take care of maintainence and construction and with this outfit he can set poles up to thirty-five feet, string messenger strand and cable and many other jobs that ordinarily would require the help of several men.

Jim has very cleverly solved the problem of getting all of his equipment out to the job. The maintainence truck which he must have for tools, supplies, etc., tows the derrick by means of a tow bar, which he also made, and this in turn tows the pole trailer which fastens to the derrick chassis with a regular ball and socket trailer hitch.

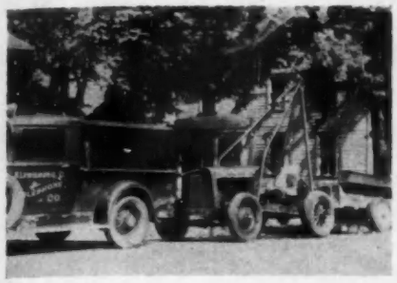
I was amazed at the things Jim could do with this outfit. For instance to place rings on messenger strand, he erects a ladder between the legs of the derrick and with another man driving along the cable lead in super low gear, he can place rings as the car is driven along. He even used the outfit once to get a horse out of



Collapsible takeup reel made from scrap material.

Let HOLTZER-CABOT Engineers help solve your ringing problems
Alternating Current MOTOR-DRIVEN


FOUR FREQUENCY SET
★ ★ ★ ★ ★ ★ ★ ★ ★
★ WE HAVE A COMPLETE LINE OF TELEPHONE RINGING EQUIPMENT ★
★ ★ ★ ★ ★ ★ ★ ★ ★
For complete information, Write
THE HOLTZER-CABOT ELECTRIC CO.
125 Amory St., Boston, Massachusetts 6161 So. State St., Chicago, Ill.



Complete one man outfit including truck, towing derrick, winch and trailer.

a hole into which it had fallen. There are in fact, many things too numerous to mention, for which it may be used.

The enclosed pictures will give you a clearer idea of Mr. Willis' ingenuity. If you feel that your subscribers might be interested further, I will try to get another picture of the earth boring part when it is finished, however, since Jim is pretty busy keeping his exchange in first class condition, it may be delayed a while.

Anyone interested in the mechanical details of the construction of "Little Sampson" can write directly to Mr. Willis and I am sure he will be glad to go further into the technical side of building a unit of this sort than I have been able to do in this letter.

With best personal regards, I remain,

Yours very truly,
Jim Walls, Field Representative
Kellogg Switchboard and Supply Company.

▲

Tennessee Commission Sets Jan. 17 to Hear Case

The Tennessee Railroad and Public Utilities Commission has ordered a hearing Jan. 17, 1944, in the intrastate rate case of the Southern Bell Telephone & Telegraph Co., it was learned Oct. 20. The date was set after the Commission had taken under advisement a petition of the telephone company for an additional eight months in which to make studies of the case.

The Commission has ordered the company to show cause why intrastate toll rates in Tennessee should not be reduced to the level of A.T. & T. interstate rates as of September, 1941, and has also ordered it to show cause why its intrastate rates in Tennessee should not be reduced to conform with its own interstate rates. Commission Chairman Porter Dunlap and Commissioner John C. Hammer originally overruled Commissioner Leon Jourolomon, Jr. in the latter's request that the hearing be held within 30 days and that some of the company's funds be impounded pending settlement of the case.

"AMERICAN"
Now Working for Victory . . .

Is Also Planning for "V" Day

OUR military leaders have had to develop equipment for the desert, the mountain, the jungle—equipment peculiarly adapted to each condition. But when it came to mobile equipment for the Signal Corps they found in "American's" Telephone Maintenance Bodies built-in adaptability to meet their most severe requirements.

And the reason—"American" equipment is the result of long years of research, and practical field experience. It's planned equipment designed and built to meet normal and abnormal working needs and demands.

Today while working at top speed to fill government orders "American" is planning for the Peace. Thinking ahead so that you may have a more complete line of mobile construction and maintenance equipment. Equipment that will mean more in the way of economy, comfort and service.

All these things, however, cannot happen the day the war ends. It will take time for the change-over. "American", however, will be ready to deliver to you, just as fast as chassis are available, equipment of the same type as made before the war.

Always alert for new trends, "American" Engineers have their sights set for high marks. In order to attain this ideal they invite your suggestions.

Some Reasons Why "Americans" Are TOPS:—
Correct Design • Superior Quality Construction • Comfort • Convenience • Safety • Endurance • Low Operating Cost • Fine Appearance

THE American COACH & BODY CO.
PUBLIC UTILITIES EQUIPMENT FOR MOTOR VEHICLES

Line AND Desk

Q. We are interested in making up a display board showing the condition of messenger strand, the idea being to enable our newer employees to recognize a dangerous condition of the the strand without unnecessary junking what we would consider good strand. Has any company tried out this idea?

A. Yes, a certain company has made up a number of such display boards for use in exchanges handling messenger strand in their storerooms and also for the information of construction crews engaged in rebuilding cable plant. Figure 1 shows a display board illustrating seven different stages of deterioration of messenger strand. The condition of a messenger in service may be determined by comparing its size and appearance with that of the corresponding specimen on the display board.

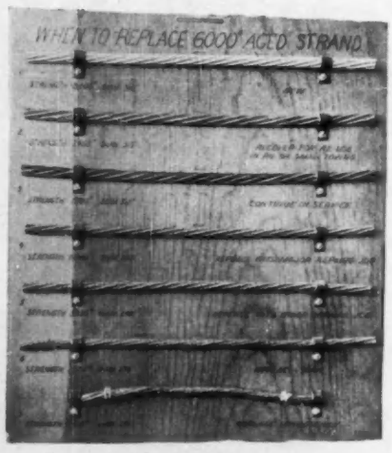


Figure 1—Display board showing stages of deterioration of messenger strand.

Q. Will you explain the terms "dial speed" and "dial impulse ratio" as used in connection with the adjustment of dials in automatic switching systems. Which is considered the more important?

A. The term "dial speed" means the frequency at which the electrical impulses for operating the automatic switches are sent by a dial. This speed

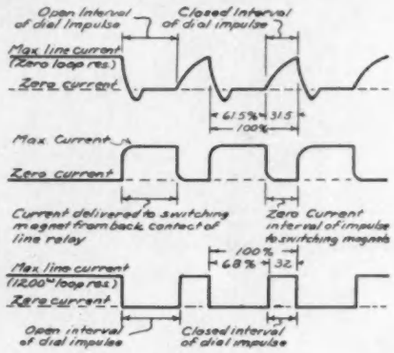


Figure 3—Illustrating the relation between the open and closed intervals of dial impulses. Top—Wave form of impulses transmitted through line. Center—Impulses repeated to switching magnets from back contacts of line relay. Bottom — Theoretical wave form of impulses.

is usually held to 10 impulses per second with a permissible variation of ± ½ impulse per second for dials of Automatic Electric Company make on adjustment in the repair shop.

The term "impulse ratio" refers to the ratio of the closed interval to the sum of the open and closed intervals of a impulse transmitted by the dial expressed in per cent. In Automatic Company dials, the impulse ratio is made 38½ per cent closed contact and 61½ per cent open contact (Figure No. 3), this being the optimum value established by laboratory experiments. The optimum impulse ratio is only slightly less important than the correct frequency of the dial impulses. The operation of relays in the central office switching mechanism is influenced to a considerable degree by the character of the impulses transferred from the dial at the subscriber's telephone to the central office. Line resistance and capacity, leakage between the conductors, and the inductance of the switching magnets all affect the exact shape and spacing of the dial impulses, lengthening the closed circuit intervals and shortening the open circuit periods. Since the switching magnets operate from the back contact of the line relay in Strowger switches (that is, they are energized during the open circuit intervals of the dial impulse train), these intervals should not be shortened to any appreciable degree or the driving power of the magnets may be affected. By holding the dial impulse ratio to the optimum value at the subscriber's dial, the influence of the above distorting factors is reduced to a minimum.

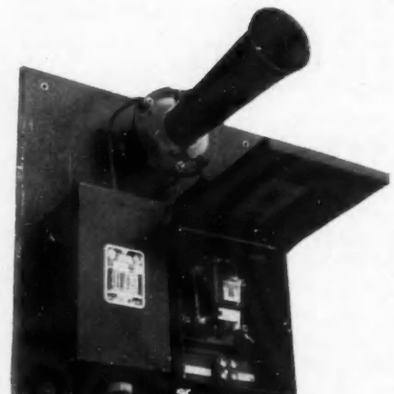


Figure 2—Horn signal unit for use in noisy locations.

Q. How would you arrange some kind of a loud signal that can be heard in a very noisy place such as a machine shop? We are not getting very satisfactory results with our ordinary loud ringing gongs in such a location.

A. For calling employees to the telephone in very noisy locations, it is suggested that an automobile horn be arranged to operate from a step-down transformer (110-volts primary to 4 to 24-volts, 2 amperes secondary). An A. C. relay with heavy contacts is utilized to close the horn circuit, this relay being operated from the telephone circuit by ringing current. A condenser is connected in series with the relay to prevent operation of the relay by the battery feed i ncommon battery systems. Figure 2 shows a photograph of a shop-built signal horn unit.

The Only AUTHENTIC BUYERS' GUIDE serving the huge Telephone Industry

LISTINGS "FREE"

There is no charge for listings in the "BLUE BOOK" & BUYERS' GUIDE. Every manufacturer of equipment used by the telephone industry should have received a Blue Sheet Listing Form by November 1. Fill in and return promptly. If you have not received your Blue Sheet Listing Form please write for one.

This "HANDYMAN" for purchasers gives—

1. Finger-tip information on all equipment and supplies needed to operate any telephone company, large or small.
2. Manufacturers and Suppliers serving the industry listed three ways under "Products Classified," "Trade Names," and "Complete Names and Correct Addresses."
3. An editorial storehouse of information for everyone connected with the managing, operating and maintaining of telephone plants.
4. A useful life of 12 months (or longer if the present paper shortage becomes more acute) as a "Where to Buy It" Directory for approximately 15,000 buyers of Communications equipment.

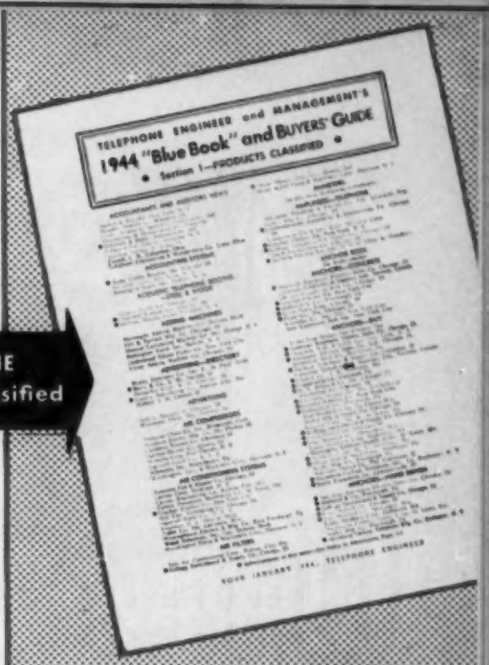
TO BE PUBLISHED JANUARY 15

The 1944 TELEPHONE "BLUE BOOK" and BUYER'S GUIDE will be mailed as a part of the January 15, 1944 issue of TELEPHONE ENGINEER & MANAGEMENT. It will be the 9th annual issue of this "Handyman" for purchasers of telephone equipment and supplies. With many new manufacturers planning on entering the field, the coming issue will be the largest and most complete we have ever published.

SPECIAL ATTENTION called to Advertisements

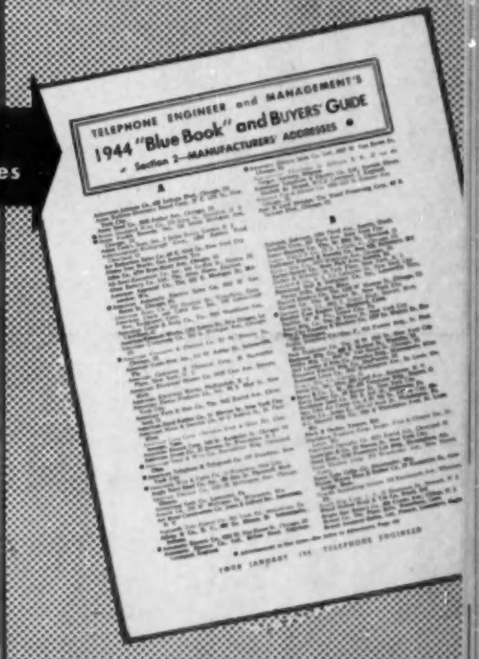
Advertisers will have attention attracted to their advertisements every time their company name, their products, or their trade names are mentioned in the "BLUE BOOK" & BUYERS' GUIDE.

No advance in advertising rates for this Special issue— Early reservations for space will earn choice positions— Make your space reservation today. Advertising copy to follow before December 20.



PART ONE
Products Classified

PART TWO
Trade Names



PART THREE
Manufacturers' Names

Publishers of TELEPHONE "BLUE BOOK" & BUYERS' GUIDE

You'll Have to Furnish the Parts

But Suttle Can Do the Rest!

After all, Suttle is the biggest telephone re-manufacturing business in the world, you know. It must be ready to serve.

DEPEND ON SUTTLE

PERMANENT MAGNETS

LET'S Research Together

You with your knowledge of and experience with permanent magnetism as applied particularly to your own problems and projected plans.
We with our broad knowledge of and experience with the subject, gained by designing and making permanent magnets for many different companies, among which are leading manufacturers of the most important instruments used by the armed forces.
Yes, let's research together. Two interested and qualified viewpoints focussed on your problem.

CINAUDAGRAPH CORPORATION
Stamford **Connecticut**
11-CC-5

Personalities

Claude Eells, who has been wire chief at the United Telephone Company and the Southwestern Bell Telephone Company for the past 29½ years retired on September 30, according to Concordia, Kan., newspapers. He was guest of honor at a retirement dinner the eve of his retirement.

•

Leo Ellis, of Hanover, Kan., has succeeded **Gerald H. Gavick,** resigned, as district manager of the Community Telephone Company in Trempealeau County, Wisc. **Mr. Gavick** has moved to the Mountain States Tel. & Tel. Co., Denver, Colo., in a supervisory position.

•

Tom Dilse, owner of the Barnett (Mo.) Telephone Exchange for the past 20 years, has announced the sale of his property.

•

William Henry Curran, 52, general plant manager for the eastern area of the Bell Telephone Company of Canada, died recently following a long illness.

•

Staff Sgt. J. C. Gabbard, Jr., former employee of the Ashland (Ky.) Home Telephone Company, has been credited as firing the first shot in the Battle of the Solomons in the S. W. Pacific area. The first shot was fired August 7, 1942 off Florida Island.

•

Former general counsel of the National Federation of Telephone Workers **Charles V. Koons** has just been promoted from 1st Lieutenant to Captain in the Army Air Forces. **Captain Koons** is now stationed with the Materiel Command of the Army Air Forces at Wright Field at Dayton, Ohio. He has been on duty with the AAF since March 1, 1943. Before entering the service he had handled the legal affairs and Washington representation for the NFTW for approximately two years.

•

H. H. (Hi) Armstrong, 48, division commercial superintendent for eastern Oklahoma of the Southwestern Bell Telephone Co. with offices at Tulsa, died early in August from heart failure due to a heat stroke. **C. F. Loranger,** commercial supervisor at Oklahoma City, has been named to succeed Mr. Armstrong in Tulsa.

•

Fred L. Thomas, assistant to the president of the Indiana Bell Telephone Company, retired September 1 after 35 years of active service to the telephone industry. He was appointed to the position he leaves 21 years ago to the day.

•

Norman M. White has been appointed District Operating Manager of Graybar-Dallas, Tex. effective September 21. He is succeeded in St. Louis as service manager by **J. R. Ernest.**

•

W. G. Wade, general superintendent of the Interstate Telegraph Co., Bishop, Calif. has started a survey for a new telephone line between Deep Springs, Calif. and Silver Peak, Nev.

•

Lyle O. Brown, for the past year manager of the St. Louis office of the Southwestern Bell Telephone Company, has been appointed district manager of the western Missouri division effective September 1.

•

John Daley, who served for 35 years as secretary and treasurer of the Tampico Farmers Mutual Telephone Co. of Tampico died Sept. 8. **Mr. Daley** served several terms as Mayor of Tampico and also held the office of Postmaster at one time.

•

William A. Condit, former division manager of the New York Telephone Co., and vice president of the Chesapeake & Potomac Telephone Co., died Oct. 21 at the age of 58.

•

FCC Chairman James Lawrence Fly is to be the guest of honor at a dinner of the Washington chapter of the National Lawyers Guild at the Mayflower Hotel Nov. 19. **Vice President Henry A. Wallace** and **OWI Director Elmer Davis** will be guest speakers at the testimonial affair in

honor of the Commission chieftain who also is slated to make an address.

•

Major General Harry C. Ingles, Chief Signal Officer of the Army, received the Citation of Merit Nov. 4, from the Poor Richard Club in Philadelphia, one of the nation's leading advertising and public relations organizations. The Citation of Merit is an award of the Poor Richard Club which has been conferred upon many notable figures in the United States.

•

J. N. Johnson, general manager and **R. H. Harlow,** district supervisor of the Ashland (Ky.) Home Telephone Company were recently disposing of some old files in their Lancaster office and unearthed some records that opened their eyes. To their surprise they found papers revealing the existence of a Kentucky Telephone Association as early as 1900. It was not the Independent association that Johnson now heads as president for that state.

•

Hunter L. Gary, after several years work in New York and Washington, D. C., has moved his headquarters back to Chicago. He was honored recently by Secretary of Treasury Morgenthau who presented him with a citation for distinguished service in behalf of the War Savings program. His new address is 332 So. Michigan, Chicago.

•

James L. Capel has purchased the Bondville (Ill.) Telephone Co. and is now operating the property as part of the Champaign County Telephone Company.

•

George Davis has been named manager of the Tampico (Ill.) Farmers Mutual Telephone Co., succeeding **John H. Daley**, deceased.

•

Frank Glaze succeeds **Albert Gibson** as manager of the Mt. Sterling, Ill. exchange of the Illinois Valley Telephone Co., who is now with the Star Telephone Company at Seville, O.

•

R. J. Judge is re-establishing the service at Thedford, Nebr. where service was abruptly discontinued last July when **J. H. Figard** the former owner said he was too busy operating a large ranch to be a hello girl The new name is the Thomas County Telephone Company and plans are already in the works to build a toll line from Thedford to Brownlee and rural lines out of the latter town. The Nebraska commission has granted his rate application effective December 1, 1943, or on the first day of the following month after institution of service.

•

Leon F. Roberts, commercial manager of the Jamestown (N. Y.) Telephone Corporation, and former mayor of Jamestown, was honored by the leading local newspaper by the complete reproduction of the address he made before the recent USITA national convention on the value of advertising by Independent telephone companies.

AMERICAN
CREOSOTE WORKS
PINE POLES

For greater strength and outside plant economy, choose American Creosote Works' southern yellow pine poles.

Tests have proven that yellow pine poles are ***stronger.*** Pressure-treated with creosote, they are thoroughly preserved to assure long life. They stand up in storms, sleet, and high wind.

Fast shipment and quick service are assured.

Distributed By:

STROMBERG-CARLSON COMPANY

Factory & General Offices:
Rochester 3, N. Y., U. S. A.
Branch Offices:
Chicago Kansas City San Francisco Toronto

Chosen For Use On America's Longest Line*

1500 miles of changing temperature—from temperate to sub-zero—demand the use of glass insulators which will serve without breakage or failure, regardless of weather.

"Whitall Tatum" Glass Insulators, made by the ARMSTRONG CORK COMPANY, give all-weather performance—they are subjected to severe thermal shock tests, among other precision-control steps, to insure their dependability.

Write for full data about Armstrong's "Whitall Tatum" Glass Insulators. ***As distributors, we recommend them.***

*stretching over 1500 miles into Alaska

STROMBERG - CARLSON COMPANY
Factory and General Offices: Rochester 3, New York, U. S. A.
Branch Offices: Chicago, Kansas City, San Francisco, Toronto

PROOF!

ACTUAL LABORATORY TESTS SHOW THAT THE "PAPER" METHOD OF OBTAINING METAL TEMPERATURE GIVES HIGHLY VARIABLE RESULTS

LAB-REPORT

"In the test, pieces of paper were inserted in molten solder. Simulating actual field conditions, the thickness and characteristics of the papers varied. Some were newspaper, some wrapping paper, still others light cardboard. These all turned brown at different temperatures. Error was further increased by unbiased observers who disagreed on exact shade of brown in test papers.

EXACT TEMPERATURE

Dillon Temperometer always reads the same. No chance for error. Instantaneous. Handy. Priced low to make the job right!

$6 each.

W. C. DILLON & CO. INC. 5410 W HARRISON STREET CHICAGO ILLINOIS

PREMAX

For Permanent Identification

When the stenciled markings on poles and other equipment have weathered away, look into Premax Stamped and Embossed Metal Letters, Figures and Pole Markers.

They'll do the job at less than stenciling cost . . . and last as long as the pole.

Premax Products

Division Chisholm-Ryder Co., Inc.
4409 Highland Ave., Niagara Falls, N. Y.

Colonel Ralph L. Hart, Signal Corps, was appointed last fortnight Chief of the Production Branch, Procurement Division, of the Signal Procurement and Distribution Service under **Major General William H. Harrison.** He succeeds **William V. Kahler,** who has served as the civilian head of that Branch since last July and has returned to the Illinois Bell Telephone Co. where he is to become state area general manager of that company.

•

Earl H. Painter, general counsel of the Southwestern Bell Telephone Co. since 1933, has been appointed a vice president of the Company, it was announced Oct. 22 by president A. C. Stannard. **Mr. Painter** will continue to be in charge of the Southwestern Bell's Legal Department and will perform other duties which president Stannard and the Board of Directors may assign to him.

•

Clarence G. Stoll, president and director of the Western Electric Company, was elected to the board of governors of the National Electrical Manufacturers Association at their annual meeting held in the Waldorf Astoria recently.

•

Effective October, 1. **A. C. Lamperti** became secretary and comptroller of Graybar Electric Company, succeeding **M. E. Wagner,** according to an announcement by **A. H. Nicoll,** president.

•

Dr. Melville H. Manson has been appointed Medical Director of the American Telephone and Telegraph Company, effective November 1, succeeding Dr. Cassius H. Watson, who retired October 1 under the Bell System plan of retirement at age 65.

•

Harold V. Bozell, president of the General Telephone Corporation and chairman of the USITA Committee on Taxation, appeared before the House Ways and Means Committee in Washington recently to present several ideas from the Independent telephone industry on future taxation to remedy a number of inequities in the present law.

•

The American paratroopers in their invasion of Sicily for the first time dropped miles of telephone wire enabling the various parachute units to remain in communication with each other in case their portable radio sets were injured in their jumps or during fighting on the ground.

25 YEARS AGO THIS MONTH

Taken from TELEPHONE ENGINEER files of November, 1918.

In November of 1918 a call was made for 100 French-speaking men to apply to the Chief Signal Officer in Washington for service as switchboard operators in France. This feature was mentioned in an editorial and the magazine was mailed two days before the Armistice was signed. Pictures also showed views in France of various telephone installations with one view of the War Department's own recently completed telephone and telegraph building located at 1723 F St., Washington, D. C. Appeals were also made in the same issue for Trench Electricians, Electrical and Mechanical Engineers and Telephone and Radio Men with all of them being assigned to the various schools then serving the government for training.

★

The Official Orders and semi-official comment on the new Bell compensation contract together with several Orders signed by President Woodrow Wilson and Postmaster General Burleson were also reviewed in TELEPHONE ENGINEER in November, 1918. The form of agreement together with a statement of A. T. & T. president Theo. N. Vail was also carried in full with interpretations of the United States Independent Telephone Association by its then president, the late F. B. MacKinnon. A series of questions and answers was issued by the Association to further acquaint the Independents with the new orders and the compensation contract.

★

Feature articles, 25 years ago this month, appearing in TELEPHONE ENGINEER were by H. N. Faris on "Service Standards Precede Rate Standards" in which the author gave a basis for scoring magneto plant performance and establishing quality values. Another by Harold S. Osborne presented a paper on "Design of Transpositions for Parallel Power and Telephone Circuits" and several articles were included on wartime practices in the Army and in the operating field in general. Fred W. Scholz discussed in a continued article, "European Telephone Practice."

Highlights of the Communications News

(Continued from page 21)

tired) for the Navy Department opposed the original bill which would have included permission for both domestic and international mergers. Since then the Navy Department has participated in studies on the subject and the committee report expressed the belief that these studies and findings will greatly assist the Congressional fact-finding investigation.

In regard to the probing of the domination of world communications by the British, the Senate report cited that the five Senators who had completed their world survey of the war fronts had told the Senate about the restrictions "under which United States communication carriers in the international field operate; their inadequacy in serving United States interests; and their inability under present organization to break into powerful cartel-dominated communications empires."

Directory Paper

ALTHOUGH the War Production Board in its recent amendment of the Commercial Printing Limitation Order L-241 restricted printers to the use of 85 percent of the paper used in 1941, no substantial hardships to the telephone industry in the publication of the directories and the printing of subscribers' bills are expected to result.

However, under the revised L-241, telephone directories must conform to two specifications: the body basis weight of the book must not exceed 28-pound stock in a size 24 by 36; and the cover basis weight must not be more than 110-pound stock in a size 22½ by 28½.

In discussing the amended order, an official of the WPB Printing and Publishing Division highly commended the American Telephone and Telegraph Co. and several of the Independent companies, including the Rochester Telephone Corp., for "the swell job they have done" in voluntarily reducing the size of their directories by approximately 15 per cent within the last two years.

A commercial printer handling telephone directories and subscribers' bills, it was explained, may print a full order from a telephone company, providing he deducts any excess stock used from his overall yearly quota, and it was felt that where necessary, most printers would cooperate with the telephone companies in this respect in view of the sound customer relations maintained by the utilities over the years. It was also noted that in cases where telephone exchanges had doubled or trebled in size due to wartime conditions, necessitating a much larger director, an appeal for additional paper stock for the printer handling the directory could be made to the WPB, with every assurance that the request would be granted.

FCC Conference

TO LAUNCH the tremendously difficult task of postwar allocation of the radio frequencies, FCC Chairman James Lawrence Fly Nov. 4 announced that a conference to map out the organization and procedure of studies for the new charting of the spectrum would be held Nov. 17 at which both the Government and all branches of the radio industry will be invited to attend.

SUB-CYCLE

A POWERFUL RINGING CONVERTER

Which Meets the Demands of Wartime

Sub-Cycle is built for heavy duty and will stand up under the most severe operating conditions.

Sub-Cycle relieves maintenance men since there are NO MOVING PARTS TO ADJUST and it requires no routine maintenance.

Other features of Sub-Cycle:

- ★ Economical in operation.
- ★ Quiet.
- ★ Cannot interfere with radio reception.
- ★ Output voltage regulation between no load and full load is very close.
- ★ Manufactured in 6 models, for loads ranging from small PBX to the large central office.

*Also PULSATORS

Distributed By:

STROMBERG-CARLSON COMPANY

Factory and General Offices: Rochester 3, N. Y., U. S. A.

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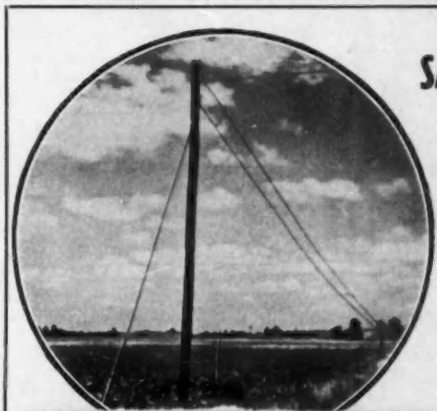

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Those represented at the conference —and Chairman Fly stressed that it was only for the purpose of laying out the plans for studies and the organization of committees to survey the various radio services' requirements of the future—will be the Board of War Communications, the Interdepartment Radio Advisory Committee, the FCC Engineering Staff and for industry the engineering officials and heads of the panels of the recently created Radio Technical Planning Board which will comprise the leading engineering experts in all branches of radio and electronics.

Chairman Fly emphasized the complexities of postwar radio allocation with the marvelous developments which have been produced for the Armed Services under the pressure of military demands and described the multitude of new radio services in aviation, communications, electronics, frequency modulation and television which are pressing for space in the new spectrum. Radio, he related, will go far beyond the Very High bands which were in use before the war and the spectrum may be extended into entirely new territory, from 10 kc. to 300,000 kc or possibly later up to 30,000,000 kc.

The conference on Nov. 17 is not

Signal Corps Photo

A class "A" cross arm is being fastened on a pole by T5 William Orr of Mt. Enterprise, Texas, and T4 George Krech of South St. Paul, Minn., in the construction of a South Pacific island pole line.

going to try to settle anything at that initial session, but will be for exploratory and organizational purposes. He noted that the final decisions on allocations will be made by the FCC for civilian needs and the IRAC, which is headed by FCC Commissioner T. A. M. Craven, will plan for the Government radio needs with recommendations now through the Board of War Communications to President Roosevelt. The radio industry technical experts and engineers from the RTPB will assist and advise the FCC and the IRAC. At the meeting it is planned to divide up the work of utilization of the spectrum for the future requirements of the radio services among committees on which both Government representatives and industry technical experts will serve.

FCC Chief Engineer E. K. Jett cautioned that the expansion of the spectrum would depend to a marked extent on the development of equipment capable of utilizing the higher wave lengths. He cited that, although experimental apparatus was now being successfully used in laboratories on wave lengths up to 30,000 megacycles, in practical usage existing equipment is now in operation only up to 300 megacycles.

In regard to the future relaying of television, especially for television network broadcasting, Chairman Fly and FCC Chief Engineer Jett stressed that radio relaying probably up in the 1,000,000 kc region would be a most important method, but that, if it were economic and feasible, coaxial cable would be the medium. In addition to save space in the radio spectrum Chair-

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man Fly said that wire lines should be used wherever possible.

Wage Hour

A HEARING by the Wage and Hour Administration is the next step in regard to the proposal that the minimum of 40c an hour should be immediately made effective for the telephone industry ahead of the statutory date of Oct., 1945. This boost from the present 30c minimum wage under the Fair Labor Standards Act was recommended at a meeting of the Wage-Hour Industry Committee for communications, the utilities and miscellaneous transportation and now Wage-Hour Administrator Walling is empowered to put it into effect after a hearing.

At the committee's meeting the Independent telephone industry through its USITA Employee Relations Committee opposed a blanket 40c increase and suggested a substitute plan which would establish different minimum wages for smaller telephone companies on a graduated upward basis, determined on the number of stations in service. This proposal was presented to the committee in a report by Vice-President and General Manager John H. Agee of the Lincoln, Nebr., Telephone & Telegraph Co. and by USITA Executive Vice-President Clyde S. Bailey.

The plan of the Independent industry, however, was rejected by the committee with a 10 to 5 vote with all of the labor union and public members of the committee supporting the immediate institution of the 40c minimum wage, while the 5 industry members of the body favored the USITA plan—This procedure of the lining up of the public and labor union members demonstrated the "cut and dried" prejudging of such issues as happens so often in Federal governmental proceedings on labor matters.

The report of Mr. Agee and Mr. Bailey to the committee pointed out that the imposition of the 40c wage rate might result in curtailment of employment among Independent companies and that it would cause a substantial increase in operating expenses of the smaller telephone companies. Mr. Bailey cited that approximately 10,000 of the more than 12,000 communities in the United States where the Independent companies operate are served by exchanges with less than 500 telephones and, of course, under the Fair Labor Standards Act these are exempt and that the large majority of the remaining 2,000 exchanges are in communities having between 500 and 5,000 stations. It was emphasized that the living costs in the smaller towns were much less than in the large cities, so that a lower wage was not out of line. If the USITA is unsuccessful in obtaining a relaxation of the immediate establishment of the 40c wage rate, it is understood that an effort will be made to extend the present period for learner switchboard operators, with their lower rate scale, to a year or more. To establish the 40c rate would throw out of line the existing wage progression schedules for operators and mean a general upward revision of all operators' pay scales.

Duplicate Telegraph Offices

TO implement the objectives of the Western Union Telegraph Merger, the FCC has authorized the new domestic consolidated telegraph company to eliminate about 1800 duplicate telegraph offices throughout the nation now serving substantially the same areas. The Commission, by a 3 to 2 vote, ordered that the elimination of the duplicate offices be done in an orderly fashion and stated that this step would provide for more efficient use by the merged company of the facilities and personnel of both West-

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ern Union and the former Postal Telegraph system.

The authorization was hedged about with conditions and exceptions which the FCC majority cited as protecting "the interests of the public." The need for the elimination of the 1800 duplicate offices, the Commission announced, arose immediately following the consummation of the merger and telegraph traffic became heavily concentrated in Western Union offices, overtaxing its facilities and personnel, while former Postal offices remained relatively idle.

The sanction of this move was made at a special FCC meeting and for a time the vote was 2 to 2 and only when Chairman James Lawrence Fly joined the session was the decision made. The three majority members were Chairman Fly, and Commissioners T.A.M. Craven and Ray C. Wakefield, while the two dissenters were Commissioners Paul A. Walker and Clifford J. Durr.

The conditions and exceptions laid down by the FCC to protect the interests of the public prohibited Western Union from dismantling any trunk pole line, wire, conduits or cables; the closing of any functional office or the closing or cutting of hours of service of any office in a community where the nearest available telegraph office is located more than a quarter of a mile away; and the closing or reduction of hours of service or other impairment of the operating efficiency of any office which is the only office in a community. Where a duplicate telegraph office is eliminated Western Union may not reduce the maximum combined hours of service now being given by the Western Union and former Postal offices to the community, the FCC stipulated.

The purpose of these conditions, the FCC stated, is to prevent the merged company from reducing present hours of telegraph service and to retain the better quality of service provided in any community by either of the duplicate offices.

Western Union, upon the request of the FCC, may be required under the authorization order to reestablish immediately any office, to replace any facilities, or to restore service formerly furnished. The overall adequacy of telegraph service is to be a continuing subject of study by the Commission under the program which has been under way for some time after the Board of War Communications had requested such a survey by the FCC. This study will be continued particularly in connection with the need for new offices, relocation of existing offices and general improvements in the types of service provided the public.

Western Union also has been granted FCC permission to file on not less than one day's notice amendments to its tariffs which will effect the aims of the merger.

Meanwhile, the American Telephone & Telegraph Co., has been completing an inventory of its TWX and leased wire services with a possible view to the sale of these services to the consolidated Western Union company.

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2. Easy, "floating" swivel mechanism.
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Manufactured by
STURGIS
POSTURE CHAIR COMPANY
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Electrical Fundamentals For the Telephone Man

(Continued from page 24)

Fig. 10. Fixed capacity paper insulated condensers used in radio and electrical circuits

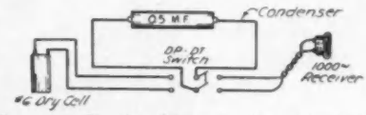


Fig. 11. Simple demonstration of ability

is passed through them their inductance will be lowered due to the core becoming magnetically saturated. (If of the iron core type). See Figure 8.

Condensers

IN ALTERNATING current circuits considerable use is made of condensers. This is particularly true in radio circuits. A condenser consists of an arrangement of metallic plates, generally tin foil, separated and insulated from each other by some form of **dielectric** such as parafined paper, mica, and in some cases air. When the two terminals attached to the metallic plates of a condenser are connected to a voltage source, current surges into the condenser charging it. If the charging source is then disconnected from the condenser, it will be found that the charge will remain in the condenser until it is discharged or until the charge leaks away from the dielectric material. It should be noted that the electric charge of a condenser is held not on the metallic plates but rather in the dielectric material between the plates. (See Figures 9 and 10.)

Demonstrating Storage Effect of Condenser

THE action of the condenser referred to above can easily be demonstrated by connecting an ordinary 1 mf or 0.5 mf condenser to a single dry cell. Disconnect the dry cell and after a few seconds connect an ordinary radio headphone across the condenser terminals. The moment that the headphone is connected to the condenser a click will be heard indicating that the power stored in the condenser is being dissipated in the telephone receiver. Figure 11 illustrates this effect.

Factors That Control Capacity

THE amount of electricity a condenser is capable of storing depends on three factors, namely:

(1) The size of the metal plates.
(2) The separation between the plates.
(3) The dielectric power of the insulating material between plates.

The capacity of a condenser is rated in terms of a unit known as the **farad.** This unit is quite large and typical condensers such as are found in radio and electrical work generally have rat-

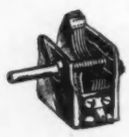


Fig. 12. Common size (.000365 m.f.) radio tuning condenser

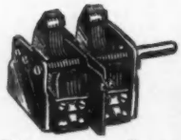
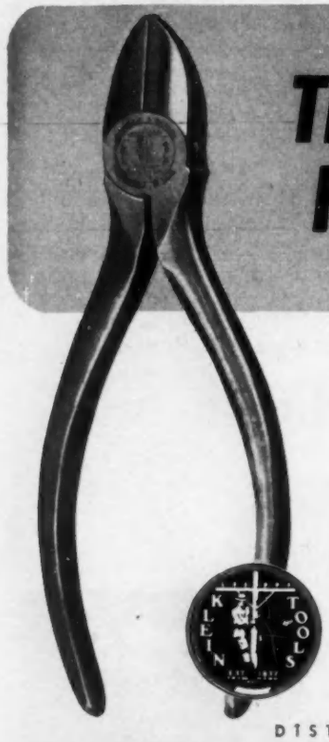


Fig. 12-1. Gang tuning (Two condensers controlled by one shaft)



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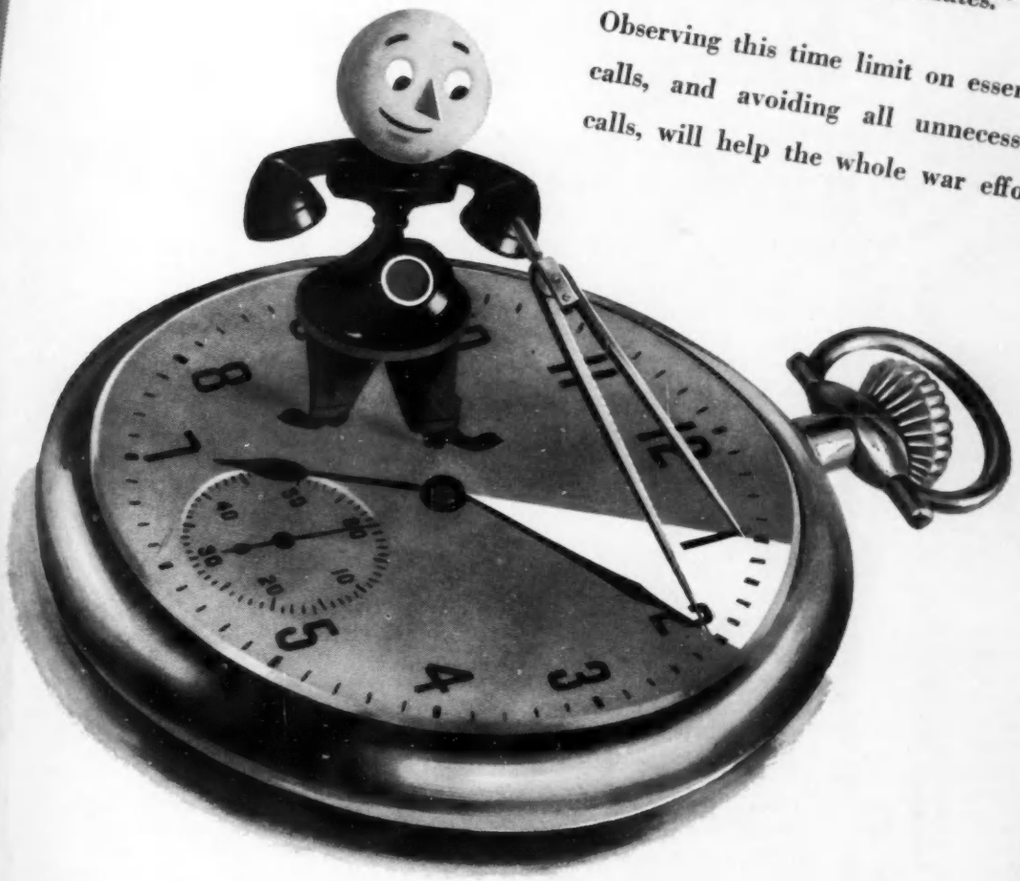

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Fig. 12-2. High voltage-high capacity electrolytic type condenser used in A.C.-D.C. power supply units (about 8 m.f. at 450 volts)

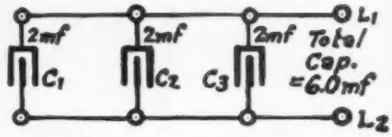

Fig. 14. Computation of condensers in parallel (total capacity equal to sum of separate capacities)

ings of a fractional part of a farad known as a **micro-farad,** which is 1 millionth of a farad. For example, the condenser used in the average telephone is generally a 1 m.f. condenser, that is its capacity is one millionth of a farad. The tuning condenser used in typical radio sets have maximum capacities of about .000365 m.f. (Fig. 12)

The farad is defined as the capacity of a condenser **whose voltage will be raised 1 volt by a current of 1 ampere flowing into it for 1 second.** Inasmuch as this is an exceptionally large unit, it is seldom used in practice, as the capacity of condensers with which we ordinarily work is generally rated in microfarads.

Voltage Rating of Condensers

CONDENSERS have another characteristic that must be taken into account in using them, viz., their voltage rating. Inasmuch as a condenser is essentially two metal plates spaced close together but insulated by some dielectric such as mica, air, glass, etc., it is obvious that the voltage applied to the two plates must be kept below the value that would cause an electric spark to jump across the insulating material that separates the two plates.

In most radio circuits it is necessary to tune several coils with a single control. This is accomplished by **gang condensers,** which consist of several condensers on a single shaft. (Fig. 12-1)

Condensers are therefore rated in terms of the voltage they can withstand. For example, a 1000 volt D.C. and 600 volt A.C. condenser would be one that could be used on a 1000 volt direct current circuit and a 600 volt A.C. circuit. The lower A.C. rating is

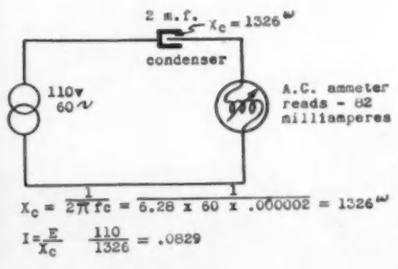
2 m.f.
$X_c = 1326^\omega$
condenser
110v
60~
A.C. ammeter reads - 82 milliamperes
$X_c = \frac{1}{2\pi fc} = \frac{1}{6.28 \times 60 \times .000002} = 1326^\omega$
$I = \frac{E}{X_c} \quad \frac{110}{1326} = .0829$

Fig. 13. Current flow in 110 volt A.C. circuit containing a 2 m.f. condenser

due to the fact that the peak voltage of a 600 volt A.C. circuit would be much higher than the actual measured voltage and this must be taken into account. When a spark jumps between the plates of a paper insulated condenser, the heat generated carbonizes the paper making it conducting and causing a leak between the two plates thus interfering with the normal action of the condenser. (See Figure 12-2)

Action of Capacity in a Circuit

IN THE preceding paragraph, we learned that if a coiled conductor is placed in an alternating current circuit, it retards the flow of current in that circuit and its impeding effect is referred to as 'inductive reactance." A condenser when placed in an alternating current circuit also offers an impedance or retarding effect to the flow of current. The magnitude of this impeding effect depends upon the capacity of the condenser. The larger the capacity the smaller the impedance offered to the flow of AC current.

It should be noted that a steady direct current cannot flow through a condenser as only pulsating or alternating current can pass through a condenser. This fact is made use of in many circuits in which it is desired to separate alternating current and direct current. By placing a condenser in the circuit, the alternating current can pass through but the direct current cannot.

Computation of Capacity Reactance

THE retarding effect which a condenser placed in an alternating current circuit offers can easily be computed by the simple formula:

$$X_c = \frac{1}{6.28fC}$$

Where:

X_c = capacity reactance in ohms.
f = frequency in cycles.
C = capacity in farads.

This equation merely states that the reactance in ohms of a condenser may be computed by dividing 1 by 6.28 times the frequency of the alternating current in cycles times its capacity in farads.

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Telephone Engineer HANDBOOK TABLES

File—Pole Design
Date—Nov. 15, 1943

Subject: Pole Classification System

Table No. 4 — Minimum Dimensions of Northern White Cedar Poles.

Class	1	2	3	4	5	6	7
Min. Top Cir.	27″	25″	23″	21″	19″	17″	15″
Length of Pole (feet)	Minimum Circumference in Inches at Six Feet from the Butt						
16					26.0	24.0	22.0
18			32.5	30.0	28.0	25.5	23.5
20	39.5	37.0	34.0	31.5	29.0	27.0	25.0
22	41.0	38.5	36.0	33.0	30.5	28.0	26.0
25	43.5	41.0	38.0	35.5	32.5	30.0	28.0
30	47.5	44.5	41.5	38.5	35.5	33.0	30.5
35	50.5	47.5	44.0	41.0	38.0	35.0	32.5
40	53.5	50.0	46.5	43.5	40.0	37.0	
45	56.0	52.5	49.0	45.5	42.0		
50	58.5	55.0	51.5	47.5	44.0		
55	61.0	57.5	53.5	49.5	46.0		
60	63.5	59.5	56.5	51.5			

Table No. 4 — Minimum Dimensions of Chestnut Poles.

Class	1	2	3	4	5	6	7
Min. Top Cir.	27″	25″	23″	21″	19″	17″	15″
Length of Pole (feet)	Minimum Circumference in Inches at Six Feet from the Butt						
16					22.5	21.0	19.5
18			28.0	26.0	24.0	22.0	20.5
20	33.5	31.5	29.5	27.0	25.0	23.0	21.5
22	35.0	33.0	30.5	28.5	26.5	24.5	22.5
25	37.0	34.5	32.5	30.0	28.0	25.5	24.0
30	40.0	37.5	35.0	32.5	30.0	28.0	26.0
35	42.5	40.0	37.5	34.5	32.0	30.0	27.5
40	45.0	42.5	39.5	36.5	34.0	31.5	29.5
45	47.5	44.5	41.5	38.5	36.0	33.0	31.0
50	49.5	46.5	43.5	40.0	37.5	34.5	32.0
55	51.5	48.5	45.0	42.0	39.0	36.0	
60	53.5	50.0	46.5	43.5			

Note: Classes 8, 9, and 10 have minimum top circumferences of 18″, 15″, and 12″, respectively, and no minimum dimensions for pole butt.

A simple twist of the wrist and they're on...

Easy installation only one feature of CHANCE CABLE RINGS

- They're easy to install because spiral hook provides leverage.
- They're easy to stock in boxes plainly labeled for size and kind.
- They're easy to transport because of unit packaging.
- No-Tangle package simplifies handling on the job.
- Spiral hook prevents slipping.
- Shoulder hook prevents jumping.
- Curved bearing surface prevents sheath cutting.

A-B-CHANCE CO.
CENTRALIA MISSOURI

Test-O-Lite
TESTS ANY VOLTAGE...
100 to 550 Volts, A.C. or D.C.
—Safely, Swiftly, Surely.

THE NEON GLOW LOCATES TROUBLE INSTANTLY
in electric circuits, fuses, cutouts, motors, radios, appliances, etc.

PUTS "FINGER" ON THE TROUBLE SPOT
Indicates hot or grounded wires. Tells AC from DC. Far superior to ordinary clumsy test bulb. Indispensable in shop or home. Has PATENTED safety features. Vest pocket size with clip. Life time guarantee. List $1.50. (Priority A-7 required.) Purchase thru electrical dealers.

L. S. BRACH Mfg. Corp.
55-63 Dickerson St. Newark, N. J.

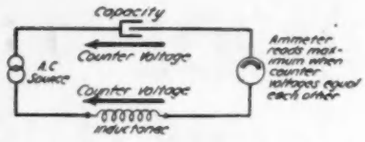


Fig. 16. Neutralizing effect of capacity and inductive reactance

Practical Condenser Problem

TO ILLUSTRATE the use of the above capacity reactance equation let us work out a practical problem. See Figure 13.

What is the reactance in ohms of a 2 mf condenser when placed in a 60 cycle lighting circuit?

$$\frac{1}{6.28 \times 60 \times .000002} = 1{,}326\omega$$

That is, a 2 mf condenser if connected to a 60 cycle circuit would draw about the same current from the circuit as would a 10 watt light.

The following table shows how capacity reactance varies with frequency for a number of different size condensers.

Capacity in Series and Parallel

WHEN more than one condenser is connected in parallel the total capacity across the circuit is found by simply adding all of the separate capacities together. For example, the three capacities shown in figure 14 each have a capacity of 2.0 m.f. but the combined capacity is equal to the sum of all three or 6 m.f., i.e., $2 + 2 + 2 = 6$ m.f.

If condensers are connected in series the total capacity equals the reciprocal of the sum of the separate reciprocals of all the capacities. That is, to compute total capacity of condensers in series, divide the capacity of each condenser (in m.f.s) into 1.0 then add together the results of all of the separate divisions. The result of this division should then be divided into one. Note.—The term reciprocal means one over any number. To illustrate, the reciprocal of 5 is $\frac{1}{5}$ or 0.2.

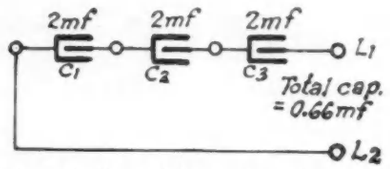


Fig. 15. Computation of condensers in series (total capacity equal to reciprocal of the sum of the separate reciprocals of all capacities

An example of condensers in series is shown in Figure 15. The total series capacity is 0.66 m.f., which was found as follows:

Step No. 1.—Find separate reciprocals $\frac{1}{2} = 0.5$, $\frac{1}{2} = 0.5$, $\frac{1}{2} = 0.5$

Step No. 2—Add separate reciprocals. $0.5 + 0.5 + 0.5 = 1.5$

Step No. 3—Divide result of Step No. 2 into 1.0.

$$\frac{1}{1.5} = 0.66 \text{ m.f}$$

Capacity Reactance in Ohms for Various Frequencies and Capacities

Cap. In Mfds	Radio Broadcast Frequencies		Audio Frequencies		Power Frequencies
	500,000	1,500,000	50	10,000	60
.00005	6,369.4	2,123.1	63,694,267	318,471	53,078,503
.0001	3,184.7	1,061.6	31,847,133	159,235	26,539,252
.00025	1,273.8	424.6	12,738,853	63,694	10,615,600
.0005	636.9	212.3	6,369,426	31,847	5,307,850
.001	318.5	106.2	3,184,713	15,924	2,653,925
.005	63.7	21.2	636,943	3,185	530,785
.01	31.8	10.6	318,471	1,592	265,393
.015	21.2	7.1	212,314	1,061	176,929
.02	15.9	5.3	159,235	796	132,697
.05	6.4	2.1	63,694	318	53,078
.1	3.2	1.1	31,847	159	26,539
.25	1.28	.42	12,739	64	10,616
.5	.64	.21	6,369	32	5,308
1.0	.32	.11	3,184	15.9	2,654
2.0	.16	.05	1,592	7.9	1,326
4.0	.08	.03	796	3.9	664
6.0	.05	.02	585	2.6	442
8.0	.04	.01	398	2.0	332
10.0	.03	.001	318	1.6	265
15.0	.02	—	212	1.06	177

Series Resonance

WE have learned that either capacity or inductance impedes the flow of alternating current when placed in a circuit. If, however, we place both inductance and capacity in series in a circuit, the total impedance or retarding effect to alternating current is less than if either one were in the circuit alone. The reason for this is that the **retarding effect of an inductance opposes the retarding effect of a condenser;** hence, the two effects tend to cancel out. If the capacity reactance in ohms is exactly equal to the inductive reactance in ohms, the actual impeding effect offered by these series elements will be zero. Inasmuch as all condensers and inductances have some resistance, however, there will be some impeding effect in the circuit due to this resistance which does not cancel. This neutralizing effect of a capacity and inductance when placed in series in a circuit is referred to as **series resonance.**

Fig. 16 illustrates this opposing effect of capacity reactance and inductive reactance.

NOTE—Section B of Part VII will appear in the next issue with Questions for both sections.—Ed.

For Quicker Longer Service

SYLVANIA TUNGSTEN TELEPHONE SWITCHBOARD LAMPS

ACTUAL SIZE

FASTER—Light up in one-fifth second.

BRIGHTER—Maximum end-on candle power. Sharper daylight signals.

STRONGER—Average life 1,500 hours of high brilliancy. Strong breakage resistant filament. Tight, correctly formed bases.

Available in: CLEAR
NATURAL RUBY*
NATURAL GREEN*

*While present supply lasts

SYLVANIA
ELECTRIC PRODUCTS INC.
SALEM, MASS.

Formerly Hygrade Sylvania Corporation

Minnesota Exchange Sold

A deal was closed October 1st in which Mr. and Mrs. George Gerrels purchased the Pillager (Minn.) Telephone Exchange from Frank L. Allen.

Mr. and Mrs. Allen have owned and operated the local telephone company since 1914.

The new owners plan to reconstruct and improve the lines and equipment as material and equipment become available and hope to give the community continued good service.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of March 3, 1933,

of Telephone Engineer and Management, published monthly at Pontiac, Illinois, for October 1, 1943.

State of Illinois, County of Cook, ss.—Before me, a notary public in and for the State and county aforesaid, personally appeared Ray W. Smith, who, having been duly sworn according to law, deposes and says that he is the editor of the Telephone Engineer and Management, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc, of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Illinois.

Editor—Ray W. Smith, 7720 Sheridan Road, Chicago, Illinois.

Business Managers—Ray W. Smith & Roy F. Smith, 7720 Sheridan Road, Chicago, Illinois.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address as well as those of each individual member must be given.)

Telephone Engineer Publishing Corp., 7720 Sheridan Road, Chicago, Illinois.

Ray W. Smith, 7720 Sheridan Road, Chicago, Illinois.

Roy F. Smith, 7720 Sheridan Road, Chicago, Illinois.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state.)

Ray W. Smith, 7720 Sheridan Road, Chicago, Illinois.

Roy F. Smith, 7720 Sheridan Road, Chicago, Illinois.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

RAY W. SMITH,
Editor.

Sworn to and subscribed before me this 27th day of September, 1943.

(My commission expires July 1, 1947).
(Seal) DOROTHY E. HOLMES,
Notary Public.

★ ★ ★ ★ ★ ★

NATIONAL DEFENSE

★ ★ ★ ★ ★ ★

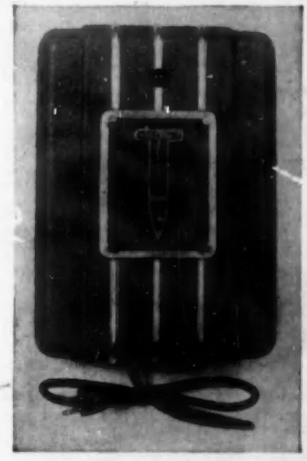
has

PRIORITY

While "all-out" National Defense cooperation is taxing our production facilities — We are proud we have been able to continue to make satisfactory deliveries to our government and to our customers in the telephone field.

TELERING

Reliable ringing service is essential in providing satisfactory telephone service.



Directly converts Commercial Alternating Current to Telephone Ringing Current—Current Consumption Negligible—Positively NO radio interference.

Use TELERING and provide the MOST reliable service at the LEAST cost.

Order through your jobber or direct from

TELKOR, Inc.
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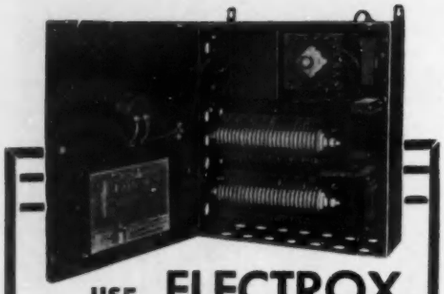


USE ELECTROX
RECTIFIERS
to Replace Your Batteries

• Supplies DC power for all types of telephone equipment.

BATTERY ELIMINATORS — with or without power-off relays for magneto operators' sets.

BATTERY ELIMINATORS—with constant voltage output for PAX and PBX, with or without sub-cycle ringer.

BATTERY CHARGERS — for trickle charging telephone batteries.

AUTOMATIC BATTERY CHARGERS — for exchange batteries.

Write for Additional Information

ARMY E NAVY

Awarded October '42.
RenewedSeptember'43.

SCHAUER MACHINE CO.
2064 Reading Rd. Cincinnati, Ohio

Cook Holds Engineering Conference

On September 20th and 21st, Cook Electric Company held a two day engineering conference at the Drake Hotel in Chicago, attended by Cook's entire engineering force.

Mr. Walter C. Hasselhorn, president, key-noted the meeting by pointing to the necessity of post-war thinking, in terms of new developments and improving Cook products with "super" engineering, while maintaining and increasing war production.

Mr. John Jaap and Mr. Chester Ruth, representing the Telephone Division, presented their ideas as to what the telephone industry will require for the post-war era. Engineering advances made during the war must and will be incorporated into Cook telephone protective and distributing equipment.

Murdock
PHONES

Murdock Telephone Sets are extremely attractive units. Base is black molded bakelite with metal bottom and rubber feet. "Solid-Built" receiver is very sensitive—gives extremely fine, clear reproduction of voice tones.

Manufacturers of Modern Telephone Sets, Plugs, Push Buttons, and RADIO PHONES since 1904. Write to Dept. 85 for catalogue.

WM. J. MURDOCK CO.
Chelsea, Mass.

40-Year Pins Distributed

To celebrate their forty years of continuous service with their firm, thirteen employees of the Stromberg-Carlson Company, Rochester, N. Y., were recipients of Forty-Year Pins and tendered a luncheon at the company plant October 5th. Wesley M. Angle, president of the firm, who also marked his fortieth year with Stromberg-Carlson, presided. Dr. Ray H. Manson, vice president and gen-

40-Year Pins distributed by Stromberg-Carlson at the recent celebration. 13 pins were awarded.

eral manager, and Edwin C. Roworth, vice-president, both of whom have been with the company 39 years, made the presentation. Shown at the luncheon are, standing left to right, James S. Gibson, Edwin C. Roworth, Alfridolf O. Stigberg, Eugene Reinke, D. Walter Brown. Seated, left to right, are Joseph Gaulioso, Sr., James T. McGuire, Wesley M. Angel Miss Minnie Maierhofer, Dr. Ray H. Manson, John H. Levis, and Matthew J. Cross. A half dozen others in the company's branch offices also qualified for the Forty-Year Pins.

Fred H. Pinkerton Named

L. D. Ely, president of Reeves Sound Laboratories, Inc., announces the appointment of Fred H. Pinkerton as director of public relations. Mr. Pinkerton was formerly manager of sales promotion and advertising of the Industrial Division of the United States Rubber Company.

Coincidentally he is serving as Public Relations Counsel to the National Electrical Wholesalers Association. Also, he has just completed designing and writing the industry book entitled, "Electrified Production," for the National Electrical Contractors Association, Washington, D. C.

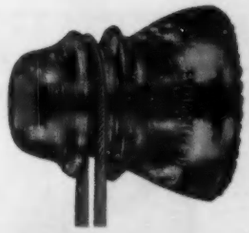
He was formerly president of the Industrial Marketers of New Jersey and in 1942 general conference chairman of the National Industrial Advertisers Association.

Here Is A Rib Tickler

A patron of the Ashland (Ky.) Home Telephone Company placed a call in one of their exchange offices to the Western Union office in a nearby town as she was desirous of wiring some money to her son in the armed forces. The Western Union rang the company agent and requested that she accept the money and deposit it in the bank for them.

Upon attempting to effect collection from the patron it developed that she was positive she had given the money to the Western Union man. Subsequent investigation revealed that she had made a neat compact ball of the currency and stuffed it into the mouthpiece of the pay station telephone.

BRUTE STRENGTH!

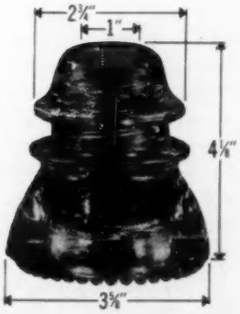


2 Things Make Hemingrays Super-strong

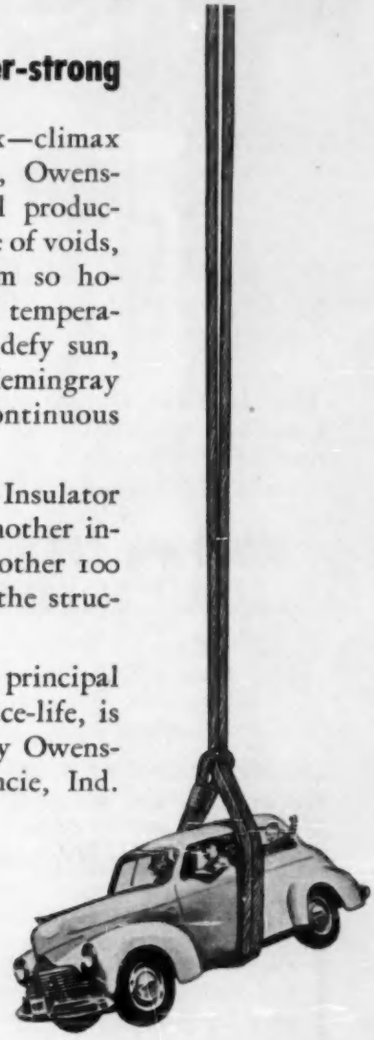
First, a "secret" glass batch-mix—climax of 87 years of experience. Second, Owens-Illinois step-by-step quality-control production. These result in Hemingrays free of voids, stresses and strains . . . makes them so homogeneous that sudden changes of temperature leave them unimpaired. They defy sun, rain, hail, snow and sleet. One Hemingray user reports . . . "thousands in continuous service for over 50 years."

Fact is, a 100-year old Hemingray Insulator could be remelted and made into another insulator that, in turn, would last another 100 years, because time does not affect the structure of their glass.

Hemingrays are sold *only* through principal jobbers. Their cost, figured in service-life, is measured in cents. Manufactured by Owens-Illinois, Hemingray Division, Muncie, Ind.



Hemingray No. 42 . . . favorite for toll lines—its long leakage path keeps rural "toll" lines trouble-free.



Using A. S. T. M. procedure, a recent test of stock Hemingray Insulators by Purdue University technicians shows a strength of 3,000 lbs. Such brute strength would easily support the family sedan—fully loaded!

OWENS-ILLINOIS

HEMINGRAY Telephone & Telegraph Insulators

EXPORT AGENTS: INTERNATIONAL STANDARD ELECTRIC CORP. • NEW YORK

Turn Your Used Kellogg Deskstand Telephones into

CASH

No. 97 Type

No. 118 Type

10,000

WANTED AT ONCE!

No. 97 or No. 118 types with or without Transmitters or Receivers.

This is Your Opportunity to Convert into cash Old Telephones for which you May Never Have a Use.

HOW MANY CAN YOU DISPOSE OF NOW!

Kellogg is offering Good Cash Prices for One or a Thousand.

WRITE TO

KELLOGG SWITCHBOARD & SUPPLY CO.
6650 So. Cicero Ave., Chicago 38, Illinois

ALSO WANTED

All Types of Used Kellogg Telephones and Equipment. Good Cash Prices Offered for Your Surplus or Idle Apparatus.

WRITE AT ONCE
Telling What You Have.

Address:

Rebuilding & Repair Division
KELLOGG SWITCHBOARD & SUPPLY COMPANY
308 West Sixth Street
KANSAS CITY 6, MISSOURI

Automatic Electric Announces Changes In Western Service Organization

AS A RESULT of the increased and steadily expanding activity in the West Coast states, and the accompanying need for augmenting service personnel and facilities in that area, Automatic Electric Sales Corporation has announced the following changes in their West Coast Organization, effective December 1st.

To enable Mr. Barrington to devote his entire time to the increasingly technical aspects of telephone company and government service matters, Mr. H. C. Smith, formerly district manager at Cleveland, will take over the administrative duties of the West Coast organization as vice president and district manager of the West Coast District. Mr. Smith will make his headquarters in the San Francisco office, and will assume general supervision over all activities of the company in that division, which includes in addition to the West Coast states, the states of Nevada, Utah, Arizona, and part of Idaho. Mr. Smith has been a member of the Automatic Electric sales organization since 1929, and has had wide experience as a field sales engineer in New York State and as an administrator in both Chicago and Cleveland.

Mr. Barrington as a staff representative with headquarters in San Francisco will be free to devote his entire attention to the greatly increased service needs of telephone operating companies and the armed services in the West Coast District. In this work he will be able to correlate the activities of and assist service representatives of the company in the District.

Mr. W. L. Dickey, as vice president and staff representative at San Francisco, will continue his present duties in connection with industrial customers in the Western Division.

Mr. H. P. Knox, who has been a member of the Cleveland office staff for some years, will continue as service representative of that office, under the supervision of Mr. A. W. MacRae, manager of the Pittsburgh office.

Schauer Wins Star For Army-Navy "E"

The men and women of the Schauer Machine Company, Cincinnati, were recently awarded for the second time the Army-Navy Award "for meritorious services on the production front," according to a congratulatory message from Robert P. Patterson, Under Secretary of War, to A. J. Kohn, president of the Schauer company.

Renewal of the award carries with it the honor of displaying a white star on the Army-Navy "E" flag, as a "symbol of the appreciation of our Armed Forces for continued and determined effort and patriotism."

A. J. Kohn, president of the Schauer Machine Company stated that the company and its employees were awarded their first "Army-Navy E" in October, 1942, and were among the first machine tool companies to be so honored. The company, said Kohn, are the originators of today's speed lathes, widely used in war production plants for the final finishing and polishing of small metal and plastics parts. The company is known particularly to the telephone industry for Electrox rectifiers, battery eliminators and battery chargers for telephone, telegraph and signal service.

Among the company's recent developments is a highly efficient, self-compensating telephone repeater, which according to Kohn, is destined for wide use by telephone companies for improving transmission in long rural and party lines and in connections from local to long distance lines, as well as by railroads, pipe line companies and others.

Kellogg Switchboard and Supply Company's newly organized girls softball team ended up a close second in the Chicago Herald-American's 1943 Metropolitan Chicago Softball Tournament, and a handsome trophy has been added to Kellogg's impressive collection of athletic prizes.

Booklet on Poles Available to Readers

Uses of pressure-treated lumber in the utility field comprises one section of a new book on preserved wood just issued by Koppers Company, Wood Preserving division, which is offered as a guide in material selection for utility engineers, contractors and maintenance superintendents.

A special section of the book, "Economical and Permanent Construction with Pressure-Treated Wood," explains the several processes by which lumber is treated to protect it against decay, marine borers, termites, acids and fire. fire.

Pictured are a number of typical installations in the utility field, including pressure-cresoted transformer stations, and telephone and telegraph lines for over-water and land lines. There also is a reference list of recommended uses of pressure-treated lumber in the utility and other fields.

A copy of the book may be obtained by writing to Koppers Company, Wood Preserving division, Pittsburgh.

A. G. Kober

Albert G. Kober, assistant advertising manager of the Stromberg-Carlson Company, Rochester, N. Y., died on October 5th following a heart ailment. He was 67 years of age.

Bert, as his friends knew him, joined the Stromberg-Carlson Company in 1905 and during his 38 years with the firm he held such positions as factory assembler, inspector, foreman, returned apparatus head, export sales editor, and assistant advertising manager.

Although the majority of Stromberg-Carlson dealers throughout the country had never met Bert, he will be long remembered for his courteous coopera-

Albert G. Kober

YOU GET

FULL PROTECTION AT EVERY POINT

TYPE 15 SUBSTATION PROTECTOR
TYPE 40 PROTECTED CABLE TERMINAL
TYPE 20 SUBSTATION PROTECTOR
TYPE 35 PROTECTED CABLE TERMINAL

with

Automatic Electric

PROTECTIVE APPARATUS

Not only are Automatic Electric protective devices built to give you a wider range of protection throughout your plant but this equipment also gives you a greater measure of protection at each specific danger point. This is because Automatic Electric substation protectors and protected cable terminals are engineered to offer maximum protection against dangerous forces. For example: the Type 20 Substation Protector has a ¾-inch air-gap between every terminal point and the metal cover. This provides an additional guard against high potentials.

In the long run you'll find that Automatic Electric apparatus gives you ***more*** protection, ***more*** economically than any other line of protection equipment. For further information write for Catalog 4068-A.

AUTOMATIC ELECTRIC

ORIGINATORS AND DEVELOPERS OF STROWGER STEP-BY-STEP MACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

Distributors in U. S. and Possessions:
AUTOMATIC ELECTRIC SALES CORPORATION
1033 W. Van Buren St., Chicago 7, U. S. A.
Export Distributors: INTERNATIONAL AUTOMATIC ELECTRIC CORPORATION

The Clearing House

For the convenience of readers of Telephone Engineer

Directories

Are MANPOWER Troubles Cutting Your Directory Adv. Sales?

★ We have the MANPOWER, the EXPERIENCED ORGANIZATION to take over your Telephone Directory Advertising, handle all details and produce MORE NET revenue (all costs considered).

Write or call at our expense.

LOOMIS ADVERTISING CO.

408 OLIVE STREET, ST. LOUIS, MO.
3rd Fl. N. Y. Life Bldg., 20 West Ninth St. Kansas City, Mo.
Citizens Trust Bldg., Fort Wayne, Ind.
135 So. Second Street, Philadelphia, Pa.

Reconstructed Equipment

Western Elec. No. 323 Transmitters complete less back @	$1.15
Western Elec. No. 2c Ball type drops and jacks 5 per strip @	8.25
Stromberg-Carlson No. 9a Talk Through repeating coils @	1.25
Dean or Kellogg 8A or 42A Repeating coils Talk through type @	.75
Western Elec. No. 154 Individual Jacks @	.3
Western Elec. No. 71 C. Retard Coils @	1.50
Kellogg No. 115 Grabaphone with 3 Cond. cord @	5.00
Kellogg No. 111 C. B. Grabaphone with 2 Cond. Cord @	5.00
Kellogg or Western Elec. Composition Rec. shells with caps New @	.45
Kellogg, Dean, W. E. Monarch, S. C. Leich or Monarch Mouthpieces New @	.08
Stromberg-Carlson No. 69A Protector rack with fuses and carbons 20 lines per strip @	3.00
Stromberg No. 55 3 Cond. Swbd. Plugs practically New @	.65
Stromberg 2 Cond. Swbd. Plugs for No. 11 drop @	.40
Switchboard cord weights @	.20
Western Elec. No. 186 A Relays @	1.00

REBUILT ELECTRIC EQUIPMENT CO.
1704 West 21st Place
Chicago 8, Ill.

tion and prompt, thoroughly-complete assistance regarding co-operative advertising, sales aids, and other promotions.

He was keenly interested in Rochester's civic affairs. For seven years he was president of his home city's Volunteer Fire Association and was Fire Commissioner for his district. He was also a member of the Genesee Chapter, Telephone Pioneers of America; Independent Pioneers Telephone Association; and Webster Lodge No. 538 F. & A.M. Bert was formerly an active member of the Rochester Chamber of Commerce.

Classified Ads

WANTED—Experienced Strowger Automatic switchman capable of doing a good adjusting and trouble shooting job. Position permanent to the right party. Location—Pacific Coast. Good wages. Write Box No. 8316 c/o TELEPHONE ENGINEER.

WANTED—Man to repair and rewire Magneto Telephones. For Factory in Chicago. Write Box 8306, c/o TELEPHONE ENGINEER.

WANTED AT ONCE: Operators for local and toll work at exchange of approximately 800 stations in South Carolina. One operator with supervisory experience also needed. Excellent climate and good working conditions. Write Central Carolina Telephone Company, Southern Pines, North Carolina.

Telephone Engineers

JAY G. MITCHELL
Consulting Engineer
Operating and Management Economics
Plant—Equipment—Revenue
P. O. Box 602
SPRINGFIELD, ILLINOIS

J. W. WOPAT
CONSULTING ENGINEER
Telephone Engineering — Construction Supervision — Appraisals — Financial — Rate Investigations
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Fort Wayne, Indiana

J. G. WRAY & CO.
Telephone Engineers
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization and Operation of Telephone Companies
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CHICAGO

Telephone Repair Co.
Repair service for Transmitters, Receivers, Desk Stands and Wall Phones—Magneto or Common Battery.
Specialists in Repairing and Rebuilding Transmitters
WE TRADE
WE BUY
WE REBUILD
Old telephones or parts into smart modern-looking wall phones or desk sets with new cabinets.
Telephone Repair Co.
Daniel H. McNulty, Manager
Rogers Park Station Chicago

Wiping the solder joint is a difficult and delicate process and that is the reason why *CABLE SPLICERS* are so particular about their Wiping Cloths. Even the smallest detail means much to the skilled craftsman.

"Williams" WIPING CLOTHS
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